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ABSTRACT

This report examines how much undergraduates work while enrolled in postsecondary education for the academic year 1989-90. It specifically addresses types of institutions they attended, educational experiences, and the relationship of their education cost and financial aid to the amount of time they worked while enrolled. The report presents data from the 1989-90 National Postsecondary Student Aid Study in narrative and tabular forms. Results suggest that not only are most undergraduates working while they are enrolled, a substantial number are working full time. Other highlights include: (1) about 75 percent of all (full and part time) undergraduates worked at some time during 1989-90 of which 40 percent reported working full time at some time while enrolled; (2) among undergraduates enrolled full time for a full academic year, about 22 percent worked full time at some time during their enrollment; (3) undergraduates who attended private, for-profit institutions were much less likely to work while enrolled (61 percent); (4) undergraduates who worked while enrolled were employed for most of their enrollment; (5) most undergraduates held jobs in the areas of administrative support, service occupations, blue collar occupations, marketing, and as sales clerks; and (6) women were less likely to work full time while enrolled than men. Includes a glossary and technical notes. (Contains 12 references.) (JB)

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Statistical Analysis Report September 1994

Postsecondary Education Descriptive Analysis Reports

Undergraduates Who Work While Enrolled in Postsecondary Education: 1989–90

Contractor Report

Laura Horn
MPR Associates

Carlyle Maw
Project Officer
National Center for Education Statistics

U.S. Department of Education
Office of Educational Research and Improvement NCES 94-311

U.S. Department of Education
Richard W. Riley
Secretary

Office of Educational Research and Improvement
Sharon P. Robinson
Assistant Secretary

National Center for Education Statistics
Emerson J. Elliott
Commissioner

National Center for Education Statistics

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September 1994

Contact:
Carlyle Maw
(202) 219–2099

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Highlights

This report uses data from the 1989-90 National Postsecondary Student Aid Study (NPSAS:90) to examine how much undergraduates work while they are enrolled in postsecondary education. The results suggest that not only are most undergraduates working while they are enrolled, a substantial number are working full time. This was true across all postsecondary institution types and student demographic characteristics. This report specifically addresses how working intensity (i.e., part-time versus full-time) differs according to enrollment status, student characteristics, and the types of institutions undergraduates attend. In addition, the relationship between financial aid, borrowing, and working is examined. Some of the more important findings follow.

- Among all undergraduates, approximately three-fourths reported working at some time during their enrollment in the academic year 1989–90. About 40 percent reported working full time (35 or more hours per week) at some time while enrolled.

- Even among undergraduates who were enrolled full time for a full academic year (9 months), about one in five (22 percent) worked full time at some time during their enrollment. By comparison, about half (48 percent) of undergraduates enrolled less than full time, full year reported working full time at some time during their enrollment.

- Undergraduates who attended private, for-profit institutions were much less likely to work while enrolled (61 percent) than were undergraduates attending either public or private, not-for-profit institutions (78 percent and 77 percent, respectively, worked while enrolled).

- Undergraduates who worked while enrolled were employed for most of their enrollment (i.e., worked an average of 85 percent of the time they were enrolled). Full-time, full-year undergraduates worked about 74 percent of the time they were enrolled, while part-time and/or part-year undergraduates worked 90 percent of the time they were enrolled.

- Most undergraduates reported holding jobs in the areas of administrative support (23 percent), service occupations (21 percent), blue collar occupations (15 percent), or marketing, which includes sales clerks (14 percent). About 10 percent reported working as executives or managers, while about 8 percent reported having jobs as technicians. The remaining undergraduates worked in professional/technical occupations (5 percent) or education (3 percent).

Undergraduate Student Characteristics and Employment

Few differences were found in employment status among various undergraduate characteristics. There were, however, some gender, racial-ethnic group, and age differences.

- Women were somewhat less likely to work full time while enrolled than were men; overall, 47 percent of men worked full time, compared with 35 percent of women.

- Asian undergraduates were somewhat less likely to work while enrolled than were either Hispanic or non-Hispanic white undergraduates (67 percent, compared with 76 percent of Hispanic undergraduates and 79 percent of white undergraduates).

- Older undergraduates (24 or older) were more likely to work full time than were those who were younger.

Financial Aid, Undergraduate Costs, and Borrowing

A number of financial aid indicators were examined in relation to undergraduate employment, including receipt of any financial aid, amount of financial aid received, education costs after subtracting grant aid (net cost), and borrowing.

- While the receipt of financial aid had little influence on whether or not undergraduates worked (about four-fifths of recipients and nonrecipients worked while enrolled), it was associated with working intensity: aid recipients were less likely to work full time than were nonrecipients.

- Undergraduates who received higher amounts of financial aid were less likely to work full time than were undergraduates who received less aid. For example, 53 percent of aid recipients who received less than $1,000 worked full time, compared with 23 percent who received $5,000 or more.

- As their net costs increased, undergraduates were more likely to work and work full time than were undergraduates with lower costs. For example, among undergraduates whose net costs were less than $1,000, 26 percent worked full time, compared with 39 percent of undergraduates whose net costs ranged from $3,000 to $5,999.

- Among financial aid recipients whose financial need exceeded their grant aid and expected family contribution (EFC), those who borrowed were less likely to work full time than were nonborrowers.

Cumulative GPA and Persistence

- Among full-time, full-year undergraduates, those working only 1–15 hours per week while enrolled were more likely to have high GPAs (3.5 or higher) than were their counterparts who worked more hours.

- Among undergraduates who initially enrolled full time, the more hours they worked, the more likely they were to drop to less than full-time enrollment or to stop attending.

Acknowledgments

The authors wish to thank all those who contributed to the production of this report. At MPR Associates, Lutz Berkner provided direction and support, especially regarding financial aid issues; Susan Choy reviewed the report and offered helpful criticism; Andrea Livingston and Randy Kim edited the final report. Finally, Jennifer Jones and Leslie Retallick performed a number of critical tasks including formatting figures, tables, and text.

We would like to gratefully acknowledge the review of this report by Dennis Carroll, Robert Burton, and Nabeel Alsalam at NCES; Elinor Greenberg of EMG and Associates; and Laura Greene Knapp at The College Board. Their helpful criticism greatly improved the report.

Foreword

This report profiles undergraduates who worked while enrolled in postsecondary education for the academic year 1989–90. It specifically presents a description of which undergraduates worked and how much; what types of institutions they attended; their educational experiences; and the relationship of their education costs and financial aid to the amount of time they worked while enrolled. The report is a collection of statistics and indicators to be used as a reference for documenting the extent of undergraduates' employment while enrolled in postsecondary institutions in the United States.

The report relies on data from the 1989–90 National Postsecondary Student Aid Study (NPSAS:90). This survey was designed to answer fundamental questions about financial aid and details undergraduates' education expenses, sources, and types of financial aid.

Most of the estimates in this report were produced using the National Center for Education Statistics (NCES) Data Analysis System (DAS), a software application that gives users the capability of specifying and generating their own tables from NPSAS data. Each estimate produced in a table is also accompanied by the standard error and weighted sample size on which the estimate was based. The DAS system is available to any person interested in further exploring the NPSAS data (see appendix B for a more detailed discussion and a person to contact for obtaining a copy).

We hope that readers of this report will find it informative and useful. We welcome recommendations for improving the format, content, or analysis to make subsequent reports even more informative and accessible.

Paul D. Planchon
Acting Associate Commissioner
Postsecondary Education Statistics Division

C. Dennis Carroll
Chief, Longitudinal Studies Branch
Postsecondary Education Statistics Division

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Chapter 1

Introduction

Background

In the academic year 1989–90, more than three-fourths of all postsecondary undergraduates worked at one time or another during their enrollment. Increasingly, postsecondary students of all types are working while in school. In a comprehensive review of college student employment rates using Bureau of Labor Statistics (BLS) Current Population Survey (CPS) data, Stern and Nakata (1991) documented a rise in student employment from 45 to 56 percent between 1959 and 1986. The increase was greatest for white females—35 to 56 percent—while white males experienced an increase from 50 to 57 percent. The authors also examined the National Longitudinal Survey of Youth Labor Market Experiences (NLSY) and reported a rise in student employment from 49 percent in 1979 to 67 percent in 1986.[1]

Studies examining the effects of student employment have focused on persistence, performance, and posteducation wages as outcome indicators. These analyses indicate that working while enrolled in postsecondary education can be both beneficial and detrimental to a student's academic and labor force success. For example, researchers have found that student employment may reduce a student's likelihood of completing college or lengthen the time it takes for those who do complete postsecondary education. At the same time, such employment may increase expected postgraduation wages (Stern 1991; San 1985).

The strength and direction of these relationships, however, vary according to a number of factors related to a student's working while enrolled in postsecondary education, such as the number of hours employed and location of employment (i.e., on or off campus). With respect to persistence, for example, Ehrenberg and Sherman (1986) reported that longer hours of work were associated with higher dropout probabilities for first- and second-year undergraduates. On the other hand, Astin found that if a job was located on campus, particularly during the first year of school, the undergraduate's chance of finishing college actually increased. Similarly, Ehrenberg and Sherman found that off-campus employment adversely affected completion probabilities, while on-campus hours did not.

Carroll and Chan-Kopka (1988) examined the association between student employment and persistence on a subsample of the 1980 High School and Beyond senior cohort (those entering postsecondary education immediately after high school graduation and attending full

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[1]The authors noted that CPS is a household survey and the primary respondent in the household may be unaware of the employment status of students living in dormitories, thus underestimating the number working. They further noted that NLSY data may more accurately reflect employment during the school year than do BLS annual data because the NLSY survey is conducted in the spring.

time until completion). They found that students who worked during the academic year were more likely to persist than were those who worked only during the summer.

In terms of performance, most studies have shown that student employment does not affect grades, especially if employment intensity does not exceed 20 hours of work per week. Moreover, there is some evidence that under certain circumstances, particularly when a job is related to the undergraduate's field of study, working while enrolled may actually enhance academic performance (Stern et al. 1990).

Labor market success has been shown to be positively affected by student employment. For example, posteducation earnings tended to be higher for students who were employed while enrolled in school, according to the review by Stern and Nakata. These authors noted, however, that no study has yet investigated whether this advantage persists beyond 5 years. The relationship between employment and future wages may also be influenced by the characteristics of the particular job, especially with regard to how many hours undergraduates work. San (1985), for instance, found that the positive effect of in-school employment on postcollege earnings tended to decline if a student worked more than about 27 hours per week.

While most research has focused on persistence, grades, and postgraduation labor force success as outcomes of student employment, some studies have noted other effects as well. Ehrenberg and Sherman, for example, found that working on campus in a student's senior year increased the chances that the undergraduate would enter a postgraduate educational program.

Exploring less academically related effects of student employment, Hammes and Haller (1983) found that working students made time for employment by reducing leisure and social time, possibly denying themselves some of the social interactions that are part of the student experience. At the same time, however, these authors also reported that students who work while enrolled in school may use their time more efficiently, may feel more competent, and may be earning money that enhances their quality of life. Furthermore, these students may also be using their jobs as a way to meet other students or initiate informal contacts with faculty.

In summary, most studies examining student employment indicate that, overall, working while attending college can have both beneficial and adverse outcomes. Findings to date include that working while enrolled has 1) little effect on performance (using GPA as an indicator); 2) a negative effect on persistence—students who work are more likely to drop out or take longer to complete their program; and 3) a positive effect on postcollege earnings up to 5 years after completion.

With the availability of data from the 1989-90 National Postsecondary Student Aid Study (NPSAS:90), researchers can begin to examine ways in which, on a national level, working while attending school is related to undergraduates' postsecondary education experiences. Due to the cross-sectional nature of the data, causal directions and outcomes of

undergraduate employment cannot be determined with NPSAS:90; however, these data can help to formulate a descriptive profile describing which undergraduates work, how much they work, and the type of jobs they have. In addition, the association between performance (using GPA) and work, as well as how likely an undergraduate who works will change from full-time to part-time enrollment during 1989–90 can also be examined. Such a profile can also serve as a basis for examining other outcomes of student employment using the forthcoming longitudinal components of NPSAS—Beginning Postsecondary Students (BPS) and Baccalaureate and Beyond (B&B).

In addition to identifying students who work while enrolled in school, NPSAS data provide invaluable financial aid information, allowing researchers to compare students' employment patterns with their financial aid status. Such information can provide, for example, insight into whether or not undergraduates who work rely less on borrowing to finance their postsecondary education.

Purpose

The purpose of this report is to present a detailed description of undergraduates who work while enrolled in postsecondary education. This report examines both institutional and undergraduate characteristics relative to employment, and attempts to answer questions such as:

- What proportion of undergraduates work while enrolled in postsecondary education, and how much do they work?
- How do undergraduates who work differ from those who do not work?
- How do undergraduates who work part time differ from those who work full time?
- How do postsecondary institutional characteristics vary with undergraduate employment?
- How is financial aid related to undergraduates' working patterns?
- Do undergraduates who work more have higher education costs (taking financial aid into account)?
- Do undergraduates who borrow for their education work more or less than non-borrowers?
- Is there an association between undergraduates' grade-point average and the amount they work?

- How likely are undergraduates to change from full-time enrollment to part-time enrollment relative to how much they work?

Data and Methods

The results presented in this report are based on data from NPSAS:90. This survey was designed to answer fundamental questions about financial aid and provides detailed information about students' education expenses, sources of funds, and types of financial aid. With respect to employment information, students were asked to provide information for all the jobs in which they had worked during the 1989–90 academic year including the kind of job, the beginning and ending dates, and the average weekly hours.

How Employment Is Defined

Based on starting and ending dates, the employment data were aggregated to monthly variables with regard to hours worked per week (adding over all jobs reported during that month). The final variable used to estimate the average number of hours worked per week while enrolled was derived by averaging the hours worked for those months in which the student was both employed *and* enrolled. For example, if a student was employed for six months of enrollment but not employed for the remaining three months of enrollment, the average hours worked while enrolled reflects only the hours worked during the six months in which the student was both enrolled and employed. In order to examine the length of time a student was both working and enrolled, a ratio of employment and enrollment to total enrollment was created. These estimates are presented as the percentage of time a student was both enrolled and employed during the student's enrollment. This report also presents other employment-related variables including the number of jobs that undergraduates reported having, work-study or assistantship participation, and the type of occupation undergraduates reported as their primary job during their enrollment.

While this report examines employment intensity according to mean hours worked, the focus of the analysis is on the distribution of students broken into the following five categories:

- No work while enrolled;
- Work an average of 1–15 hours per week while enrolled (part-time employment);
- Work an average of 16–24 hours per week while enrolled (part-time employment);
- Work an average of 25–34 hours per week while enrolled (part-time employment); and
- Work 35 or more hours per week while enrolled (full-time employment).

The focus is on this particular distribution rather than the mean hours worked since other studies have found that working while enrolled does not necessarily have a linear relationship to education outcomes. Working can be either beneficial or detrimental depending upon the number of hours worked while enrolled (see "background" discussion above).

Classification of Undergraduates' Enrollment

A number of factors may influence the amount of time an undergraduate works while enrolled. The most obvious is how much time a student is enrolled in school (referred to as attendance status in this report). There are two ways in which attendance status is determined in NPSAS:90: one is the attendance status for the term in which a student first enrolled (usually the fall); and the second is a student's attendance for the entire academic year (attendance persistence). Since the average number of hours undergraduates worked while enrolled was averaged over all the months they were both employed and enrolled for the entire academic year (July 1, 1989 to June 30, 1990), attendance persistence was used to identify an undergraduate's overall enrollment status.

All detailed tables presented in this report contain subsets to indicate attendance status as either full-time for a full academic year (enrolled full time for at least 9 months), or *not* full-time, full-year (referred to in this report as part-time and/or part-year). The purpose of this division was not to focus on full-time, full-year undergraduates (who make up only about 30 percent of the NPSAS undergraduates), but to maintain at least one homogeneous enrollment category.

NPSAS:90 undergraduates who are part time and/or part year can vary in the amount of time during which they are enrolled, from being full time for one term and just less than full time for the second term to attending less than half time for part of the academic year. Classifying these undergraduates according to more specific enrollment patterns would have produced subsets too small to find statistical significance when making comparisons among subsets.[2] Therefore, in order to provide more information for undergraduates attending part time and/or part year without reducing their sample size, attendance status for the term in which they first enrolled (full-time, at least half-time, or less than half-time) is presented as a row in the tables.

Institutional and Undergraduate Characteristics

Institutional characteristics are identified in three ways in this report: according to control (that is, whether an institution is controlled publicly or privately—either not-for-profit or for-profit); level (less-than-2-year, 2- to 3-year, and 4-year—either doctoral or

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[2]One additional problem associated with identifying the specific attendance patterns of part-time and/or part-year students is that about 12 percent have missing information regarding the number of months they were enrolled.

nondoctoral); and both control and level (referred to as "type"). The tables presenting institutional characteristics also contain the degree program in which the undergraduate reported participating: associate's degree, bachelor's degree, undergraduate certificate, and "other" undergraduate program.

Undergraduates are identified according to their gender, race-ethnicity, age, financial dependency status, year in school, marital status, local residency, income, and citizenship. Even though not all of the characteristics were associated with employment, all are presented for the reader's reference.

Statistical Methods and Limitations of the Data

Most of the data in this report are presented in tabular format, in which the percentages reported are all row percentages. Any differences noted in the text were statistically determined using a two-tailed *t*-test adjusted for multiple comparisons. (The reader is referred to appendix B for details on statistical methodology.) While most differences that are of both practical and statistical significance are noted, the scope of this report does not allow discussion of all statistically significant differences.

When reviewing tabular findings, readers should keep in mind that a third factor, or variable, may explain an association that appears between two other variables. For example, one might expect that undergraduates attending public institutions (with lower costs) may work less than those enrolled in private, not-for-profit institutions. However, a greater proportion of older and part-time undergraduates attend public institutions and such students generally work more (due to higher living expenses and more time available for work) than their counterparts who attend private, not-for-profit institutions. Most of the obvious interactions will be pointed out in the text, and some will be controlled for in the multivariate analysis (chapter 5). However, there may be other relationships that cannot be disentangled in a descriptive analysis. Thus readers should view this report as a foundation for alternative analyses that focus on only one or two issues.

Organization of this Report

This report includes four additional chapters. Chapter 2 examines institution and student characteristics relative to undergraduate employment, while chapter 3 focuses on financial aid status with regard to employment. Chapter 4 examines undergraduate employment in relation to GPA and changes in enrollment status. Finally, chapter 5 presents results from a multivariate analysis conducted to control for variables that may be interrelated.

Chapter 2

Attendance Status, Postsecondary Institutions, and Undergraduate Characteristics

Overall, only about one in four undergraduates (23 percent) did *not* work during their 1989–90 postsecondary enrollment. Nearly twice this percentage (40 percent) worked full time, while the remainder worked part time (figure 2.1).

To further explore the extent to which undergraduates were working, a comparison was made between NPSAS:90 and the Current Population Survey (CPS) with respect to the distribution of undergraduate employment.[3] The findings from these two surveys were quite similar (figure 2.2). During October 1989 (when CPS data were collected), 34 percent of NPSAS undergraduates reported not working; 30 percent were working part time; and 36 percent were working full time. During this same period, 37 percent of CPS college undergraduates were not working; 31 percent were working part time; and 32 percent were working full time. These surveys confirm that most undergraduates are working while enrolled and that many of these undergraduates are working full time.

This chapter focuses first on the relationship between undergraduate employment and the postsecondary institutions they attended; and second, on how specific undergraduate characteristics such as gender and age were associated with working patterns.

Attendance Status and Institution Type

Distribution of Employment Intensity

Clearly, the number of hours that undergraduates reported working while enrolled was related to their attendance status (table 2.1). Undergraduates who were enrolled full time for a full academic year were about half as likely as those enrolled on a part-time and/or part-year basis to work full time (22 percent compared with 48 percent). At the same time, full-time, full-year undergraduates were more than twice as likely to work 1–15 hours per week than were part-time and/or part-year undergraduates (18 percent versus 7 percent). About one in four and one in five, respectively, of full-time, full-year and part-time and/or part-year students did not work at all while enrolled.

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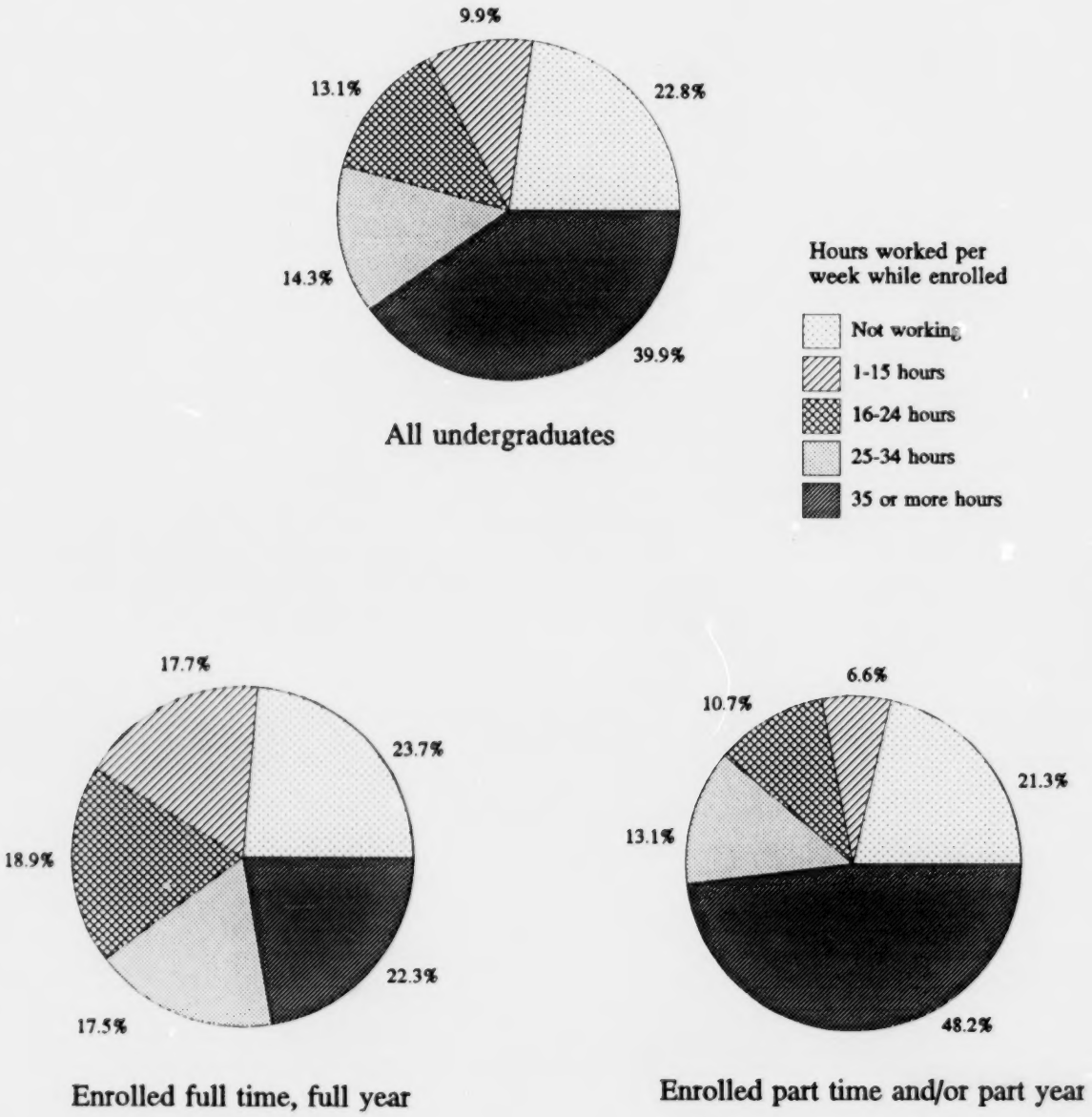
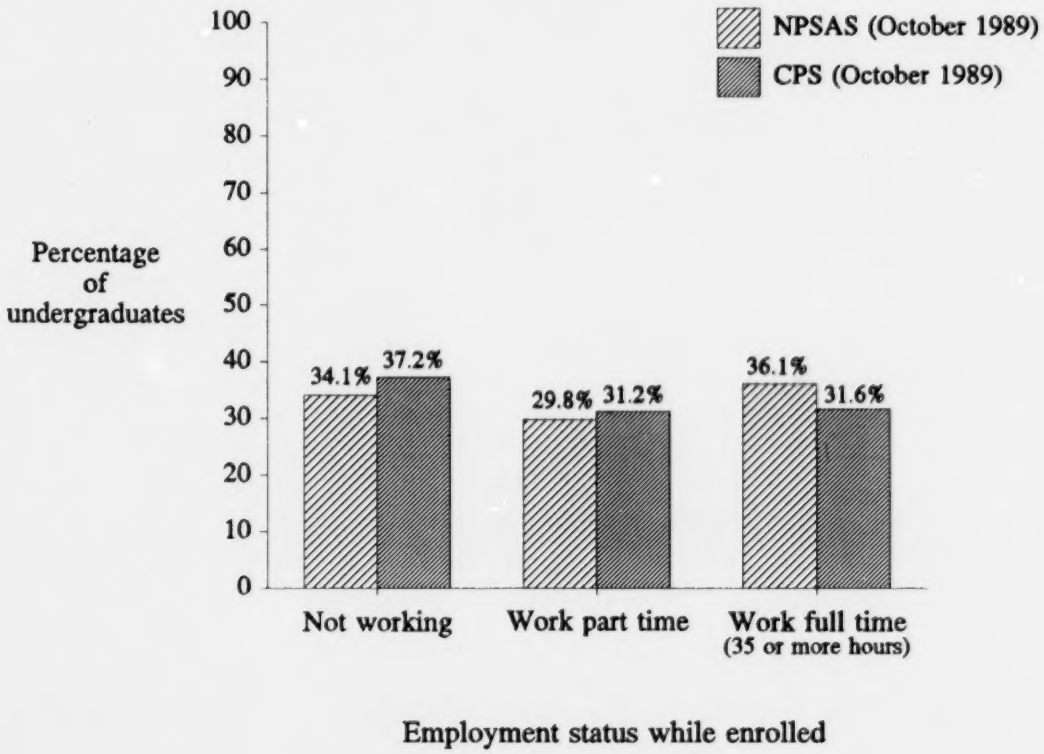
[3]Note that CPS includes households with students aged 18–24 attending college; NPSAS includes students of all ages in any postsecondary institution including non-collegiate for-profit institutions.

Figure 2.1—Percentage distribution of undergraduates' employment status while enrolled in postsecondary education, by attendance status: 1989–90



SOURCE: U.S. Department of Education, National Center for Education Statistics, 1989–90 National Postsecondary Student Aid Study (NPSAS:90), Data Analysis System.

Figure 2.2—Percentage distribution of undergraduates' employment status during the month of October 1989, while enrolled: Comparing NPSAS and Current Population Surveys (CPS)



SOURCE (NPSAS): U.S. Department of Education, National Center for Education Statistics, 1989–90 National Postsecondary Student Aid Study (NPSAS:90), Data Analysis System.

SOURCE (CPS): U.S. Department of Commerce, Bureau of the Census, Current Population Survey, October 1989.

Table 2.1—Percentage distribution of undergraduates' employment status while enrolled, by selected institutional and education program characteristics: 1989–90

	Not working while enrolled	Work 1–15 hours per week	Work 16–24 hours per week	Work 25–34 hours per week	Work 35 or more hours per week
Total	22.8	9.9	13.1	14.3	39.9
Attendance status: Persistence					
Part-time and/or part-year	21.3	6.6	10.7	13.1	48.2
Full-time, full-year	23.7	17.7	18.9	17.5	22.3
Control of institution					
Public	21.5	8.9	13.2	14.9	41.5
Private, not-for-profit	23.1	16.8	13.6	12.3	34.3
Private, for-profit	38.5	5.5	10.2	12.6	33.1
Level of institution					
Less-than-2-year	42.3	4.6	7.4	12.4	33.2
2- to 3-year	22.4	6.3	10.6	13.4	47.4
4-year nondoctoral	20.1	13.8	15.3	15.4	35.5
4-year doctoral	22.0	14.6	17.3	15.7	30.3
Type of institution					
Public					
Less-than-2-year	35.6	2.8	6.1	12.1	43.4
2- to 3-year	21.8	6.2	10.5	13.5	48.0
4-year nondoctoral	19.8	12.2	16.5	17.0	34.4
4-year doctoral	21.1	13.6	17.8	16.8	30.7
Private, not-for-profit					
Less-than-2-year	42.8	2.2	5.9	13.9	35.2
2- to 3-year	26.2	12.5	11.0	13.6	36.7
4-year nondoctoral	20.6	16.7	13.2	12.5	37.0
4-year doctoral	25.5	18.7	15.4	11.5	29.0
Private, for-profit					
Less-than-2-year	44.9	5.5	8.1	12.4	29.1
2-year or more	29.5	5.5	13.3	13.0	38.8
Undergraduate program					
Associate's degree	21.1	7.0	12.2	14.5	45.2
Bachelor's degree	21.1	15.0	16.9	15.6	31.4
Undergraduate certificate	28.8	6.7	10.2	12.8	41.6
Other undergraduate	24.6	6.5	8.8	12.8	47.3

NOTE: Percentages may not sum to 100 percent due to rounding.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1989–90 National Postsecondary Student Aid Study (NPSAS:90), Data Analysis System.

The type of institution undergraduates attended was somewhat associated with their employment patterns. These associations primarily were related to the control of the institution. Generally, undergraduates who attended private, for-profit institutions were more likely *not* to work while enrolled (39 percent) than were undergraduates in either public (22 percent) or private, not-for-profit institutions (23 percent). This pattern existed for both full-time, full-year and part-time and/or part-year undergraduates (tables 2.2a and 2.2b).

Similarly, undergraduates in less-than-2-year institutions (75 percent of whom attended for-profit institutions) were more likely *not* to work while enrolled (42 percent) than were undergraduates attending 2- to 3-year or 4-year institutions (from 20 to 22 percent) (table 2.1). This difference may reflect the fact that students often attend less-than-2-year (for-profit) institutions because they lack the necessary work skills to be successful in the labor market. In addition, these students may also be more likely to attend short-term concentrated programs, postponing work until they are finished.

Undergraduates in 4-year institutions (both doctoral and nondoctoral) were more likely than undergraduates in other level institutions to work 1–15 hours per week, while those in 2- to 3-year institutions were most likely to work full time. However, the higher proportion of undergraduates working full time at 2- to 3-year institutions held only for those attending less than full time, full year (tables 2.2a and 2.2b).

Average Number of Hours Worked

Among undergraduates who worked at any time while they were enrolled during the 1989–90 academic year, the average number of hours they reported working was relatively high—30 hours per week (table 2.3).[4] As expected, full-time, full-year undergraduates reported working fewer hours (25 hours per week) than did part-time and/or part-year undergraduates (32 hours per week). There was little variation among institution types and undergraduate degree programs with regard to the average number of hours undergraduates worked. For example, the average hours reported by part-time and/or part-year undergraduates by institution control, ranged from a low of 31 hours per week in private, not-for-profit institutions to a high of 33 hours per week for those in public institutions. While this difference is statistically significant, it is relatively small.

[4]Note that average hours worked per week refers to working intensity while students are both employed *and* enrolled. If a student is employed for only part of his or her enrollment, the hours represent only the period of simultaneous employment and enrollment. See "Duration of Employment While Enrolled" in the next section to see periods of employment while enrolled.

Table 2.2a—Percentage distribution of full-time, full-year undergraduates' employment status while enrolled, by selected institutional and education program characteristics: 1989–90

	Not working while enrolled	Work 1–15 hours per week	Work 16–24 hours per week	Work 25–34 hours per week	Work 35 or more hours per week
	Full-time, full-year undergraduates				
Total	23.7	17.7	18.9	17.5	22.3
Control of institution					
Public	23.3	16.1	19.7	19.0	21.8
Private, not-for-profit	23.2	24.1	16.9	13.3	22.5
Private, for-profit	31.4	7.5	16.6	16.1	28.3
Level of institution					
Less-than-2-year	40.8	7.5	12.6	14.3	24.8
2- to 3-year	28.0	13.1	19.1	20.5	19.3
4-year nondoctoral	20.5	19.9	19.0	16.5	24.1
4-year doctoral	22.9	19.0	19.1	16.8	22.1
Type of institution					
Public					
Less-than-2-year	43.7	9.2	10.4	10.6	26.0
2- to 3-year	27.9	13.3	19.4	21.3	18.1
4-year nondoctoral	20.6	16.8	20.4	18.3	24.0
4-year doctoral	21.9	17.6	19.7	18.3	22.5
Private, not-for-profit					
Less-than-2-year	62.6	6.5	5.4	12.5	13.0
2- to 3-year	26.7	18.6	19.2	15.1	20.4
4-year nondoctoral	20.6	25.1	16.6	13.9	23.8
4-year doctoral	26.1	23.6	17.2	12.2	20.9
Private, for-profit					
Less-than-2-year	38.2	6.8	14.0	16.0	25.0
2-year or more	26.7	8.0	18.4	16.3	30.6
Undergraduate program					
Associate's degree	28.1	12.9	19.4	19.9	19.7
Bachelor's degree	21.7	19.8	19.0	16.3	23.1
Undergraduate certificate	24.2	15.5	17.3	18.3	24.7
Other undergraduate	28.6	14.0	18.4	20.3	18.8

NOTE: Percentages may not sum to 100 percent due to rounding.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1989–90 National Postsecondary Student Aid Study (NPSAS:90), Data Analysis System.

Table 2.2b—Percentage distribution of part-time and/or part-year undergraduates' employment status while enrolled, by selected institutional and education program characteristics: 1989–90

	Not working while enrolled	Work 1–15 hours per week	Work 16–24 hours per week	Work 25–34 hours per week	Work 35 or more hours per week
	Part-time and/or part-year undergraduates				
Total	21.3	6.6	10.7	13.1	48.2
Control of institution					
Public	20.0	6.4	11.0	13.5	49.2
Private, not-for-profit	21.8	9.6	10.4	11.0	47.2
Private, for-profit	38.1	5.0	8.0	12.4	36.5
Level of institution					
Less-than-2-year	39.9	4.2	6.6	11.9	37.4
2- to 3-year	20.7	5.2	9.3	12.4	52.5
4-year nondoctoral	18.4	8.7	12.3	14.7	45.8
4-year doctoral	20.3	10.5	15.5	14.6	39.2
Type of institution					
Public					
Less-than-2-year	31.0	1.7	5.8	11.9	49.6
2- to 3-year	20.3	5.1	9.4	12.4	52.8
4-year nondoctoral	17.9	8.9	13.6	16.3	43.3
4-year doctoral	19.7	10.0	16.0	15.5	38.8
Private, not-for-profit					
Less-than-2-year	43.4	2.2	7.7	6.4	40.3
2- to 3-year	25.8	8.5	7.4	12.4	45.9
4-year nondoctoral	19.5	8.5	9.7	11.1	51.1
4-year doctoral	22.8	12.7	13.1	10.8	40.7
Private, for-profit					
Less-than-2-year	43.2	5.4	6.9	12.3	32.3
2-year or more	29.1	4.5	9.9	12.6	43.9
Undergraduate program					
Associate's degree	19.0	5.7	10.8	13.3	51.2
Bachelor's degree	19.5	10.2	14.8	15.0	40.4
Undergraduate certificate	27.6	4.4	8.3	11.3	48.3
Other undergraduate	22.9	5.2	7.5	11.8	52.5
Attendance status (term first enrolled)					
Full-time	25.2	10.6	16.5	18.1	29.6
Part-time, at least half-time	21.2	5.9	10.2	13.3	49.4
Less than half-time	18.2	3.5	6.6	8.9	62.9

NOTE: Percentages may not sum to 100 percent due to rounding.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1989–90 National Postsecondary Student Aid Study (NPSAS:90), Data Analysis System.

Table 2.3—Average number of hours per week that undergraduates who were employed while enrolled reported working during their enrollment,* by attendance status and selected institutional and education program characteristics: 1989–90

	All undergraduates	Enrolled full time, full year	Enrolled part time and/or part year
Total	30.1	24.9	32.4
Control of institution			
Public	30.6	25.2	32.5
Private, not-for-profit	27.3	23.5	31.3
Private, for-profit	31.3	28.7	32.2
Level of institution			
Less-than-2-year	32.3	28.9	33.0
2- to 3-year	32.5	25.5	33.6
4-year nondoctoral	28.1	24.7	31.0
4-year doctoral	27.0	24.6	29.5
Type of institution			
Public			
Less-than-2-year	34.6	29.3	35.7
2- to 3-year	32.6	25.3	33.6
4-year nondoctoral	28.2	25.3	30.5
4-year doctoral	27.3	25.0	29.5
Private, not-for-profit			
Less-than-2-year	32.3	—	32.6
2- to 3-year	29.4	24.2	32.1
4-year nondoctoral	27.8	23.6	32.2
4-year doctoral	25.8	23.3	29.2
Private, for-profit			
Less-than-2-year	31.2	28.7	31.8
2-year or more	31.3	28.7	32.9
Undergraduate program			
Associate's degree	31.7	25.6	33.0
Bachelor's degree	27.1	24.5	29.8
Undergraduate certificate	31.9	26.0	33.8
Other undergraduate	32.8	25.3	33.8

—Too few cases for reliable estimate (n < 30).

*Average hours refer to hours worked only while both working *and* enrolled. For example, if a student worked 20 hours a week for six months and did not work for three months, that student's average hours is still 20 hours/week. Students who reported working more than 50 hours per week (about 2 percent) were not included in this table.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1989–90 National Postsecondary Student Aid Study (NPSAS:90), Data Analysis System.

Duration of Employment While Enrolled

Undergraduates who worked in 1989–90 tended to work during most of their enrollment: on average, 85 percent of the time (table 2.4). Full-time, full-year undergraduates worked about 74 percent of the time they were enrolled, while part-time and/or part-year undergraduates worked, on average, 90 percent of the time they were enrolled.

The duration of employment for undergraduates during their enrollment varied somewhat according to the institutions they attended. Undergraduates in 2- to 3-year institutions (more likely to attend part time) worked almost the entire time they were enrolled (91 percent), and undergraduates in 4-year doctoral institutions worked about three quarters of the time they were enrolled.

In most types of institutions, undergraduates enrolled full time for a full year worked a smaller percentage of the time they were enrolled than did part-time and/or part-year students. For example, among undergraduates in 4-year doctoral institutions, those enrolled full time, full year worked about 70 percent of the time they were enrolled, while those enrolled less time worked 83 percent of the time they were enrolled.

Number of Jobs Reported

Nearly one-half of undergraduates reported being employed in only one job during the 1989–90 academic year. However, working several jobs during that time (not necessarily concurrently) was not uncommon: about one in four reported working two jobs, and 10 percent reported working three or more (table 2.5).

Undergraduates in 4-year institutions and those seeking a bachelor's degree more often reported working two or three or more jobs than did those in nonbachelor degree programs or undergraduates in less-than-4-year institutions. For example, about 13 percent of undergraduates in 4-year institutions (either doctoral or nondoctoral) reported working in three or more jobs during the academic year, compared with 7 percent for those in less-than-4-year institutions.

Not surprisingly, undergraduates who worked part time during their enrollment (at all three levels of part-time work) were more likely to report having multiple jobs (three or more) than were undergraduates who worked full time (15 to 19 percent for those working part time, compared with 9 percent of full-time workers).

Table 2.4—Average percentage of time undergraduates were both employed and enrolled during their enrollment, by selected institutional and education program characteristics: 1989–90

	All undergraduates	Enrolled full time, full year	Enrolled part time, and/or part year
Total	84.9	73.8	89.8
Control of institution			
Public	86.1	74.0	90.4
Private, not-for-profit	79.4	71.9	87.2
Private, for-profit	83.8	79.9	85.7
Level of institution			
Less-than-2-year	83.1	74.8	85.3
2- to 3-year	90.8	81.2	92.4
4-year nondoctoral	81.8	73.9	88.4
4-year doctoral	76.3	69.6	83.2
Type of institution			
Public			
Less-than-2-year	85.8	70.2	90.4
2- to 3-year	91.3	81.8	92.6
4-year nondoctoral	82.2	73.8	88.4
4-year doctoral	76.4	69.8	82.9
Private, not-for-profit			
Less-than-2-year	80.2	—	77.8
2- to 3-year	81.1	71.5	87.0
4-year nondoctoral	81.0	73.8	88.7
4-year doctoral	76.0	68.9	84.8
Private, for-profit			
Less-than-2-year	82.1	76.6	83.3
2-year or more	85.7	81.8	89.0
Undergraduate program			
Associate's degree	90.1	81.3	91.9
Bachelor's degree	78.4	71.7	85.2
Undergraduate certificate	85.7	73.3	89.8
Other undergraduate	89.8	75.6	92.0

—Not enough cases for reliable estimate.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1989–90 National Postsecondary Student Aid Study (NPSAS:90), Data Analysis System.

Table 2.5—Percentage distribution of undergraduates according to the number of jobs they reported during the academic year, by employment status and selected institutional and education program characteristics: 1989–90

	No job	One job	Two jobs	Three or more jobs
Total	17.1	48.6	24.0	10.3
Average hours worked per week				
Not working while enrolled	75.1	18.0[1]	5.5[1]	1.3[1]
Work 1–15 hours per week	0.0[2]	54.7	30.4	15.0
Work 16–24 hours per week	0.0[2]	46.5	34.6	18.9
Work 25–34 hours per week	0.0[2]	48.7	33.6	17.6
Work 35 or more hours per week	0.0[2]	65.2	26.0	8.7
Attendance status: Persistence				
Part-time and/or part-year	17.2	41.7	27.3	13.8
Full-time, full-year	16.2	52.0	22.9	8.9
Control of institution				
Public	16.7	50.0	23.7	9.6
Private, not-for-profit	15.2	43.8	26.5	14.4
Private, for-profit	27.8	42.2	21.3	8.7
Level of institution				
Less-than-2-year	31.0	42.3	19.6	7.1
2- to 3-year	18.3	52.5	21.8	7.4
4-year nondoctoral	13.9	46.3	26.4	13.4
4-year doctoral	14.8	44.3	27.2	13.7
Type of institution				
Public				
Less-than-2-year	27.4	49.0	18.3	5.3
2- to 3-year	18.0	53.0	21.7	7.3
4-year nondoctoral	14.3	47.0	26.4	12.4
4-year doctoral	14.4	45.1	27.0	13.4
Private, not-for-profit				
Less-than-2-year	33.1	43.3	17.9	5.7
2- to 3-year	19.6	44.0	25.0	11.3
4-year nondoctoral	13.4	45.1	26.4	15.0
4-year doctoral	16.2	41.6	27.6	14.6
Private, for-profit				
Less-than-2-year	32.2	39.7	20.3	7.9
2-year or more	21.6	45.8	22.8	9.8
Undergraduate program				
Associate's degree	17.0	51.9	23.1	8.0
Bachelor's degree	14.3	45.0	27.2	13.6
Undergraduate certificate	21.8	45.7	22.7	9.9
Other undergraduate	19.8	52.8	20.0	7.4

[1]Students reported all jobs including those outside enrollment.

[2]Student not working while enrolled.

NOTE: Jobs reported are not necessarily simultaneous. Percentages may not sum to 100 percent due to rounding.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1989–90 National Postsecondary Student Aid Study (NPSAS:90), Data Analysis System.

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Work-Study

Undergraduates who participate in work-study programs are typically full-time, 4-year college undergraduates. As shown in table 2.6, even among these undergraduates, about 12 percent reported work-study earnings. Undergraduates working 15 or fewer hours were much more likely to report work-study earnings (26 percent) than were those who worked more hours (8 to 14 percent).

Types of Occupations

The jobs undergraduates reported holding were primarily in administrative support or service occupations (23 percent and 21 percent, respectively) (table 2.7).[5] About 15 percent worked in blue collar occupations and 14 percent worked in marketing; 10 percent had executive or managerial positions; and about 8 percent reported working as technicians. About 5 percent and 3 percent, respectively, reported working in professional/technical occupations or in education.

Table 2.6—Percentage of full-time, full-year undergraduates attending 4-year institutions who reported college work-study earnings, by selected employment and education program characteristics: 1989–90

	No work-study earnings	Work-study earnings
Total	88.2	11.8
Average hours worked per week		
Work 1–15 hours per week	73.7	26.3
Work 16–24 hours per week	85.9	14.1
Work 25–34 hours per week	91.6	8.4
Work 35 or more hours per week	92.1	7.9
Field of study		
Business/marketing	90.6	9.4
Health	89.8	10.2
Trades and industry	—	—
Technical/engineering	90.2	9.8
Education/public service	85.8	14.2
Communications	90.9	9.1
Humanities	85.5	14.5
Science and math	85.1	14.1
Social sciences	86.6	13.4
Fine arts	86.2	13.8
Other	89.9	10.1

—Too few cases for reliable estimate ($n < 30$).

NOTE: Percentages may not sum to 100 percent due to rounding.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1989–90 National Postsecondary Student Aid Study (NPSAS:90), Data Analysis System.

[5]See appendix A for a description of the types of jobs that fall within the occupation categories.

Table 2.7—Percentage distribution of undergraduates' occupations* reported as their first job while enrolled in postsecondary education, by selected institutional and education program characteristics: 1989–90

	Marketing	Administrative/ support	Service	Executive/ manager	Education	Professional/ technical	Technician	Blue collar
Total	14.4	23.2	21.1	9.8	3.3	5.1	7.9	15.2
Control of institution								
Public	14.2	23.3	21.0	9.9	3.5	5.0	8.1	15.1
Private, not-for-profit	14.3	23.2	22.0	10.0	3.1	6.6	7.9	12.9
Private, for-profit	18.4	23.0	21.1	7.1	1.0	2.8	4.4	22.3
Level of institution								
Less-than-2-year	13.9	19.6	24.0	6.9	1.2	3.5	5.7	25.2
2- to 3-year	12.5	24.3	19.7	11.3	2.9	4.9	9.0	15.4
4-year nondoctoral	16.4	22.1	22.7	8.7	4.1	5.0	7.0	14.1
4-year doctoral	16.8	22.8	22.2	7.9	3.8	6.0	6.7	13.9
Type of institution								
Public								
Less-than-2-year	8.7	12.3	28.4	6.3	1.3	3.4	8.3	31.2
2- to 3-year	12.2	24.3	19.6	11.5	3.0	5.0	9.2	15.2
4-year nondoctoral	16.9	22.5	22.7	8.0	4.8	4.2	6.6	14.3
4-year doctoral	17.6	22.0	22.7	7.5	3.8	5.6	6.3	14.5
Private, not-for-profit								
Less-than-2-year	7.9	29.2	7.3	9.4	3.6	6.1	5.6	30.7
2- to 3-year	12.9	21.9	25.0	9.8	3.0	1.6	9.8	16.0
4-year nondoctoral	15.1	21.7	23.1	10.1	2.9	6.8	7.6	12.7
4-year doctoral	13.5	25.8	20.0	9.7	3.5	7.6	8.2	11.6
Private, for-profit								
Less-than-2-year	16.7	22.0	23.5	6.9	1.0	3.3	4.6	22.1
2-year or more	20.3	24.2	18.4	7.2	1.0	2.3	4.1	22.5
Attendance status: Persistence								
Part-time and/or part-year	12.1	24.4	23.5	11.8	3.8	5.6	9.3	14.2
Full-time, full-year	20.4	20.5	18.4	4.6	2.2	3.8	4.1	17.4
Undergraduate program								
Associate's degree	13.9	24.9	20.1	11.0	2.2	4.2	7.8	15.8
Bachelor's degree	16.8	22.5	22.8	8.1	3.5	5.5	6.9	13.9
Undergraduate certificate	12.6	22.2	22.2	8.5	2.6	4.8	9.0	18.2
Other undergraduate	11.9	22.7	18.9	11.8	5.3	5.9	9.1	14.5

*See appendix A for a description of the types of jobs within occupation classes.

NOTE: Percentages may not sum to 100 percent due to rounding.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1989–90 National Postsecondary Student Aid Study (NPSAS:90), Data Analysis System.

Student Characteristics

In order to determine whether or not certain undergraduates were more or less likely to be employed while they were enrolled in postsecondary education, they were characterized in a number of ways. For instance, they were identified according to gender, age, race–ethnicity, financial dependency status, marital status, local residence, citizenship, year in school, and income.

Though not strongly related, some student characteristics including gender, age, marital status, dependency status, and race–ethnicity (table 2.8) were associated with undergraduates' working patterns.[6] Women, for example, were somewhat more likely than men *not* to work while enrolled in school (25 percent versus 19 percent), and, if they did work, they were somewhat less likely to work full time (35 percent compared with 47 percent). These differences existed for both full-time, full-year and part-time and/or part-year attendance (tables 2.9a and 2.9b). This gender difference in working intensity may suggest greater family responsibilities on the part of women, thus limiting the amount of time they have to work. In fact, the gender difference in working intensity appeared only for students over age 23 (figure 2.3). Regardless of gender, about one in four undergraduates age 23 or younger did not work while enrolled.

Other student characteristics related to age also varied with working intensity. Undergraduates who were married and those who were financially independent (who are by definition over 23 years old) tended to work full time more than their unmarried and financially dependent counterparts. For example, about 55 percent of married undergraduates worked full time, compared with 35 percent of unmarried undergraduates. This difference, however, held only for part-time and/or part-year undergraduates. As shown in table 2.9a, married and unmarried undergraduates attending full time for a full year were equally likely to work full time (23 percent and 22 percent, respectively).

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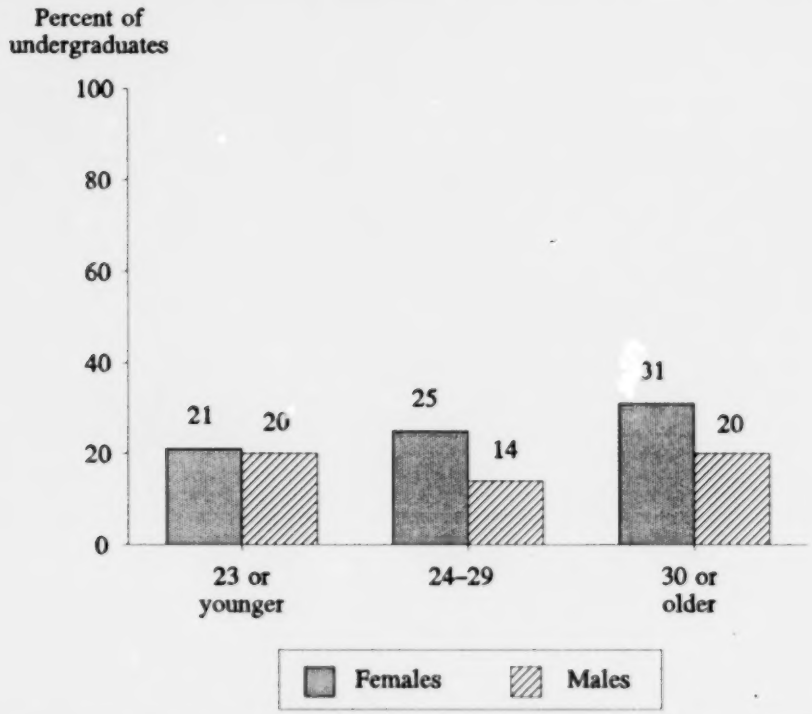
[6]For obvious reasons, citizenship was strongly related to working intensity since students who are not citizens and not eligible for work-study (e.g., the "Other" category) were much less likely to work than citizens or eligible noncitizens.

Figure 2.3—Percentage of undergraduates who did not work at all during their enrollment, by gender and age: 1989–90



SOURCE: U.S. Department of Education, National Center for Education Statistics, 1989–90 National Postsecondary Student Aid Study (NPSAS:90), Data Analysis System.

With regard to racial–ethnic group differences, Asian undergraduates were more likely *not* to work while enrolled than were either Hispanic or non-Hispanic white undergraduates: one-third of Asian undergraduates did not work while enrolled, compared with 24 percent and 21 percent, respectively, of Hispanic and non-Hispanic white undergraduates (table 2.8). Moreover, it also appeared that Asian undergraduates were less likely to work full time (28 percent) than were black, Hispanic, or non-Hispanic white undergraduates (about 40 percent in all three groups worked full time). When attendance status was held constant, only the differences between Asian and white undergraduates remained significant (tables 2.9a and 2.9b).[7]

Finally, with respect to undergraduates' year in school, first-year students were somewhat more likely not to work (25 percent) than were second-, third-, or fourth-year undergraduates (about 20 percent).

[7]When other variables such as age and dependency status were taken into account (see multivariate analysis in chapter 5), racial–ethnic groups did not differ significantly in their likelihood of working full time.

Table 2.8—Percentage distribution of undergraduates' employment status while enrolled in postsecondary education, by selected student characteristics: 1989–90

	Not working while enrolled	Work 1–15 hours per week	Work 16–24 hours per week	Work 25–34 hours per week	Work 35 or more hours per week
Total	22.8	9.9	13.1	14.3	39.9
Gender					
Male	18.9	8.6	11.9	14.0	46.7
Female	24.8	11.1	14.2	14.9	35.0
Race–ethnicity					
American Indian	23.3	10.0	9.1	11.7	45.9
Asian/Pacific Islander	32.7	12.6	14.6	11.8	28.3
Black, non-Hispanic	29.9	8.8	10.9	11.8	38.8
Hispanic	24.4	9.4	12.1	15.6	38.5
White, non-Hispanic	21.3	9.9	13.4	14.7	40.8
Age as of 12/31/89					
23 years or younger	21.0	13.1	17.3	18.5	30.1
24–29 years	21.1	6.4	9.1	11.3	52.0
30 years or older	27.8	5.1	6.3	7.1	53.7
Dependency status					
Dependent	21.2	14.2	18.0	18.9	27.5
Independent	24.2	5.8	8.4	10.0	51.5
Marital status					
Not married	20.5	11.8	15.5	17.1	35.0
Married	23.0	5.8	7.8	8.0	55.3
Separated	32.4	4.1	6.4	9.9	47.2
Local residence					
Campus housing	25.1	20.7	15.6	13.8	24.8
Off campus	23.9	7.3	10.1	11.4	47.3
With parents	19.5	9.7	17.6	20.5	32.7
Citizenship					
U.S. citizen	21.5	9.9	13.3	14.6	40.7
Eligible noncitizen	29.7	11.6	12.8	14.3	31.7
Other	55.2	10.1	10.0	5.7	18.9
Level of undergraduate class					
1st year–freshman	25.2	8.1	11.2	13.9	41.7
2nd year–sophomore	20.4	9.8	14.3	14.8	40.7
3rd year–junior	19.7	12.5	16.2	15.6	36.0
4th year–senior	20.9	14.9	15.7	14.4	34.1
5th year–higher	21.8	8.7	9.7	10.7	49.2

Table 2.8—Percentage distribution of undergraduates' employment status while enrolled in postsecondary education, by selected student characteristics: 1989–90 —Continued

	Not working while enrolled	Work 1–15 hours per week	Work 16–24 hours per week	Work 25–34 hours per week	Work 35 or more hours per week
Income and dependency					
Dependent student					
Less than $10,000	28.2	16.9	17.3	16.1	21.6
$10,000–$29,999	22.1	13.5	17.9	20.1	26.4
$30,000–$49,999	18.2	14.0	19.3	20.2	28.4
$50,000–$59,999	19.7	12.8	18.2	21.3	28.1
$60,000 or more	22.1	14.8	16.9	16.5	29.7
Independent student					
Less than $5,000	38.3	10.8	14.4	12.4	24.1
$5,000–$9,999	24.8	7.9	11.8	17.1	38.4
$10,000–$19,999	20.7	3.8	7.0	10.2	58.4
$20,000 or more	21.1	4.5	6.0	6.6	61.8

NOTE: Percentages may not sum to 100 percent due to rounding.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1989–90 National Postsecondary Student Aid Study (NPSAS:90), Data Analysis System.

Table 2.9a—Percentage distribution of full-time, full-year undergraduates' employment status while enrolled in postsecondary education, by selected student characteristics: 1989–90

	Not working while enrolled	Work 1–15 hours per week	Work 16–24 hours per week	Work 25–34 hours per week	Work 35 or more hours per week
			Full-time, full-year undergraduates		
Total	23.7	17.7	18.9	17.5	22.3
Gender					
Male	22.0	15.4	17.5	17.4	27.7
Female	24.9	19.9	20.2	17.5	17.6
Race–ethnicity					
American Indian	23.5	24.6	12.7	14.6	24.5
Asian/Pacific Islander	36.8	20.6	19.2	10.0	13.4
Black, non-Hispanic	31.4	17.4	17.0	13.5	20.8
Hispanic	29.8	17.6	23.5	14.3	14.9
White, non-Hispanic	21.8	17.5	18.8	18.5	23.4
Age as of 12/31/89					
23 years or younger	21.1	18.3	19.7	18.5	22.3
24–29 years	30.2	15.1	16.9	14.5	23.3
30 years or older	44.4	13.6	11.8	9.0	21.3
Dependency status					
Dependent	21.3	18.8	19.7	18.2	22.1
Independent	31.3	14.3	16.4	15.1	23.0
Marital status					
Not married	21.9	18.1	19.6	18.1	22.3
Married	36.2	15.8	12.9	11.9	23.2
Separated	46.4	6.8	13.9	9.8	23.2
Local residence					
Campus housing	24.0	22.8	15.7	13.3	24.2
Off campus	26.6	15.5	17.7	16.4	23.8
With parents	19.1	14.3	24.6	24.4	17.6
Citizenship					
U.S. citizen	22.4	17.8	19.0	17.9	22.9
Eligible noncitizen	41.2	17.6	19.0	10.5	11.6
Other	55.5	17.1	16.8	4.4	6.2

Table 2.9a—Percentage distribution of full-time, full-year undergraduates' employment status while enrolled in postsecondary education, by selected student characteristics: 1989–90—Continued

	Not working while enrolled	Work 1–15 hours per week	Work 16–24 hours per week	Work 25–34 hours per week	Work 35 or more hours per week
	Full-time, full-year undergraduates				
Level of undergraduate class					
1st year–freshman	27.2	16.1	18.0	17.8	20.9
2nd year–sophomore	21.5	16.9	19.0	18.4	24.1
3rd year–junior	21.1	18.3	20.8	16.8	23.0
4th year–senior	21.2	22.0	18.8	15.7	22.3
5th year–higher	26.2	12.1	20.2	21.7	19.8
Income and dependency					
Dependent student					
Less than $10,000	26.6	20.6	18.5	15.1	19.3
$10,000–$29,999	20.7	20.5	21.0	18.8	19.0
$30,000–$49,999	18.7	18.0	21.7	19.8	21.8
$50,000–$59,999	17.9	18.0	19.7	20.0	24.5
$60,000 or more	24.6	17.9	16.5	16.0	25.0
Independent student					
Less than $5,000	34.6	17.5	18.6	13.3	16.0
$5,000–$9,999	21.8	13.5	19.4	21.4	23.9
$10,000–$19,999	28.3	10.1	16.5	15.1	30.0
$20,000 or more	41.1	15.2	9.4	10.3	24.1

NOTE: Percentages may not sum to 100 percent due to rounding.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1989–90 National Postsecondary Student Aid Study (NPSAS:90), Data Analysis System.

Table 2.9b—Percentage distribution of part-time and/or part-year undergraduates' employment status while enrolled in postsecondary education, by selected student characteristics: 1989–90

	Not working while enrolled	Work 1–15 hours per week	Work 16–24 hours per week	Work 25–34 hours per week	Work 35 or more hours per week
	Part-time and/or part-year undergraduates				
Total	21.3	6.6	10.7	13.1	48.2
Gender					
Male	16.3	5.4	9.4	12.5	56.3
Female	23.7	7.7	11.9	13.9	42.7
Race–ethnicity					
American Indian	21.6	5.7	8.4	11.5	52.9
Asian/Pacific Islander	29.3	9.8	12.5	12.7	35.7
Black, non-Hispanic	27.9	5.8	8.8	11.0	46.4
Hispanic	22.5	6.9	9.1	16.0	45.5
White, non-Hispanic	19.9	6.5	11.0	13.1	49.4
Age as of 12/31/89					
23 years or younger	19.5	9.0	15.6	18.9	37.0
24–29 years	18.7	5.0	7.8	10.7	57.9
30 years or older	25.2	4.4	5.9	6.8	57.6
Dependency status					
Dependent	19.9	10.2	16.8	20.1	33.0
Independent	22.1	4.5	7.3	9.2	56.9
Marital status					
Not married	18.8	7.9	13.1	16.6	43.6
Married	20.4	4.8	7.3	7.6	59.9
Separated	28.8	3.7	5.7	10.0	51.8
Local residence					
Campus housing	25.4	16.4	15.5	15.5	27.1
Off campus	22.2	5.3	8.4	10.1	54.0
With parents	18.5	7.7	15.0	19.3	39.5
Citizenship					
U.S. citizen	20.0	6.6	10.9	13.3	49.2
Eligible noncitizen	24.9	10.3	10.9	15.5	38.3
Other	55.9	6.4	6.7	5.2	25.8

Table 2.9b—Percentage distribution of part-time and/or part-year undergraduates' employment status while enrolled in postsecondary education, by selected student characteristics: 1989–90—Continued

	Not working while enrolled	Work 1–15 hours per week	Work 16–24 hours per week	Work 25–34 hours per week	Work 35 or more hours per week
	Part-time and/or part-year undergraduates				
Level of undergraduate class					
1st year–freshman	23.3	5.5	9.1	12.9	49.2
2nd year–sophomore	18.9	6.7	12.3	13.4	48.8
3rd year–junior	17.8	8.3	13.0	14.6	46.3
4th year–senior	19.6	10.3	13.9	13.5	42.6
5th year–higher	20.8	7.8	7.4	8.6	55.3
Income and dependency					
Dependent student					
Less than $10,000	27.4	13.6	16.9	17.1	25.0
$10,000–$29,999	21.7	8.5	15.4	22.0	32.4
$30,000–$49,999	16.7	10.1	17.3	20.8	35.1
$50,000–$59,999	20.0	7.3	17.0	23.1	32.5
$60,000 or more	18.8	12.0	17.4	17.2	34.6
Independent student					
Less than $5,000	38.5	8.5	13.2	12.4	27.3
$5,000–$9,999	24.3	6.3	10.0	15.8	43.6
$10,000–$19,999	18.8	2.9	5.8	9.2	63.3
$20,000 or more	18.8	3.9	5.8	6.4	65.2
Attendance status (term first enrolled)					
Full-time	25.2	10.6	16.5	18.1	29.6
Part-time, at least half-time	21.2	5.9	10.2	13.3	49.4
Less than half-time	18.2	3.5	6.6	8.9	62.9

NOTE: Percentages may not sum to 100 percent due to rounding.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1989–90 National Postsecondary Student Aid Study (NPSAS:90), Data Analysis System.

Chapter 3

Financial Aid, Undergraduate Costs, and Borrowing

In 1989–90, about 43 percent of undergraduates received some form of financial aid for their postsecondary education, and about one-half of that aid was in the form of loans (Byce 1993). As students assume loans to help pay for their education, it is important to determine how financial aid and borrowing are related to students' working intensity while they are enrolled. For example, one might want to know whether students who get financial aid work less than nonrecipients, and further, whether students who borrow work less than nonborrowers. This chapter examines a number of financial indicators in relation to undergraduate employment, including the following:

- Receipt of financial aid;
- Amount of financial aid received;
- Education costs after subtracting grant aid; and
- Borrowing versus nonborrowing.

Receipt of Financial Aid

As shown in table 3.1, the receipt of financial aid was more likely to influence how much a student worked than whether a student worked. Aid recipients were less likely to work full time than were nonrecipients (32 percent versus 45 percent). Aid recipients and nonrecipients had similar tendencies to work (24 percent and 22 percent, respectively, of recipients and nonrecipients did not work while enrolled). These differences, however, reflected primarily the working patterns of undergraduates attending less than full time, full year (figure 3.1). The differences for full-time, full-year undergraduates were slight: 56 percent of aid recipients worked part time and 21 percent worked full time, compared with 52 percent of unaided undergraduates who worked part time and 24 percent who worked full time.

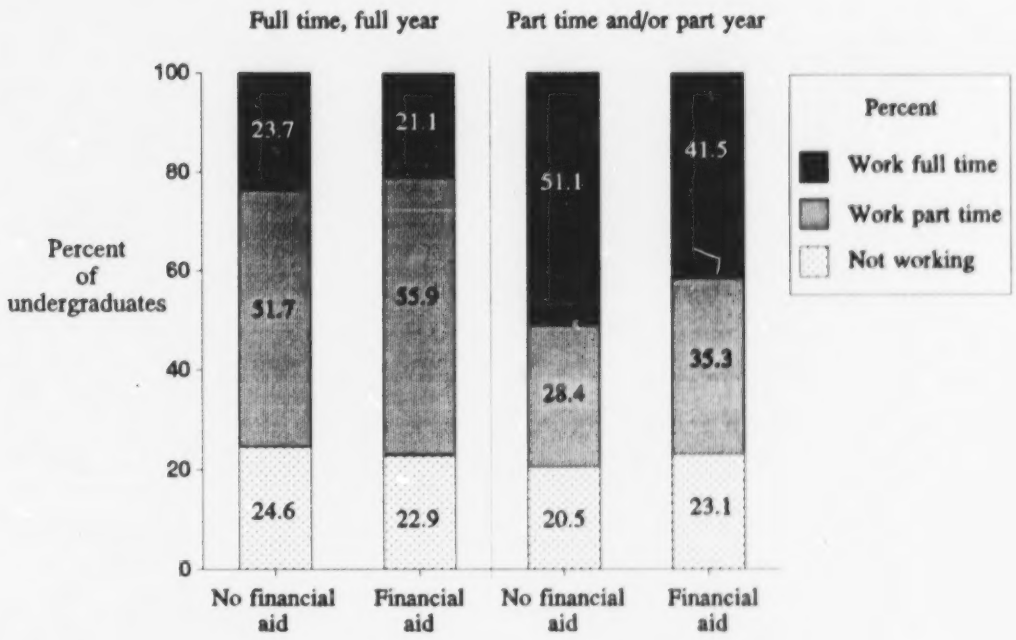
Table 3.1—Percentage distribution of undergraduates' employment status while enrolled, by attendance and financial aid status: 1989–90

	Not working while enrolled	Employed part time while enrolled	Employed full time while enrolled
		All undergraduates	
Total	22.8	37.3	39.9
No financial aid	22.2	33.2	44.6
Received financial aid	23.8	44.0	32.2
		Full-time, full-year	
Total	23.7	54.0	22.3
No financial aid	24.6	51.7	23.7
Received financial aid	22.9	55.9	21.1
		Part-time and/or part-year	
Total	21.3	30.5	48.2
No financial aid	20.5	28.4	51.1
Received financial aid	23.1	35.3	41.5

NOTE: Percentages may not sum to 100 percent due to rounding.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1989–90 National Postsecondary Student Aid Study (NPSAS:90), Data Analysis System.

Figure 3.1—Percentage distribution of undergraduates' employment status while enrolled, according to whether or not they received financial aid: 1989–90



SOURCE: U.S. Department of Education, National Center for Education Statistics, 1989–90 National Postsecondary Student Aid Study (NPSAS:90), Data Analysis System.

Amount of Financial Aid Received

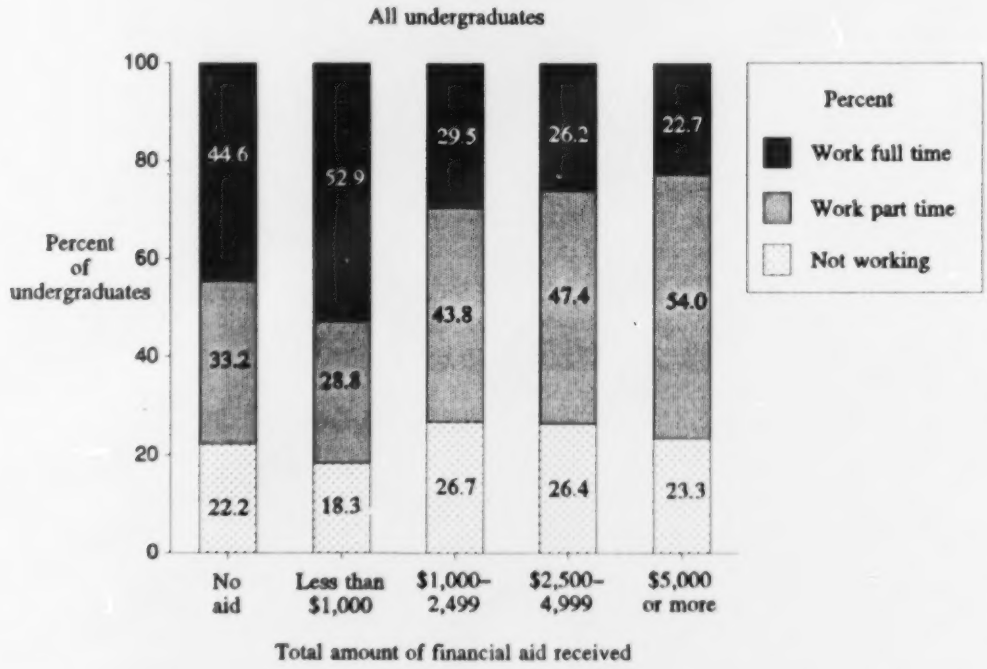
How much undergraduates worked while enrolled and the amount of financial aid they received were clearly related (figure 3.2a). Overall, the more financial aid undergraduates received, the less likely they were to work full time (and the more likely they were to work part time). For example, the percentage of undergraduates who worked full time dropped from 53 percent for recipients of less than $1,000 in aid to 30 percent for those who were receiving between $1,000 and $2,499, and further dropped to 23 percent for recipients of $5,000 or more in financial aid.

When institution control was examined separately, the variations in the amount of financial aid and employment intensity were different for private, not-for-profit institutions (where costs tend to be higher) when compared with public institutions (table 3.2). For example, the percentage of undergraduates in private, not-for-profit institutions working full time declined for each increase in the level of aid. In public institutions, on the other hand,

nearly twice the percentage of recipients of less than $1,000 in aid worked full time as those who received from $1,000 to $2,499 (53 percent versus 26 percent worked full time); and virtually the same percentage worked full time at all other levels of aid from $1,000 to $5,000 or more.

Those in public institutions receiving less than $1,000 in aid who work full time, however, may reflect the prevalence of older students already in full-time career jobs who enroll in community colleges part time to attend classes for career advancement or for their own personal benefit. In fact, as was true for the receipt of financial aid, the relationship between financial aid amount and working intensity was primarily reflective of part-time and/or part-year undergraduates (figure 3.2b). Differences were less apparent for full-time, full-year undergraduates. For example, regardless of the amount of financial aid received, about one-quarter (20 to 24 percent) of full-time, full-year undergraduates worked full time. This may, in fact, reflect the limited amount of time that full-time undergraduates have to work, regardless of the amount of aid received. Undergraduates who attend less time, on the other hand, may be more able to adjust their working schedule according to how much aid they receive.

Figure 3.2a—Percentage distribution of undergraduates' employment status while enrolled, according to the amount of financial aid they received: 1989–90



SOURCE: U.S. Department of Education, National Center for Education Statistics, 1989–90 National Postsecondary Student Aid Study (NPSAS:90), Data Analysis System.

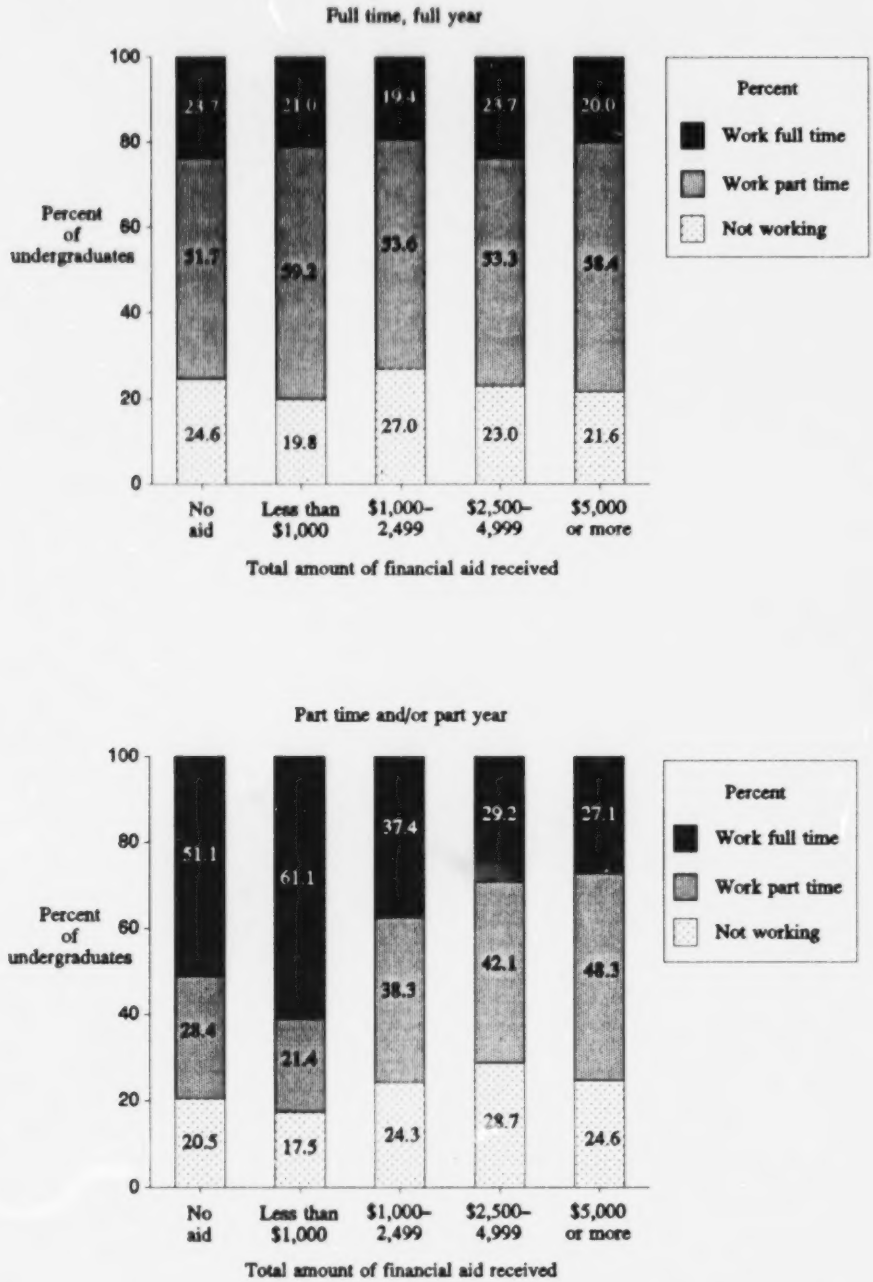
Table 3.2—Percentage distribution of undergraduates' employment status according to the average total amount of financial aid they received, by control of institution: 1989–90

	Not working while enrolled	Work part time while enrolled	Work full time while enrolled
All undergraduates			
Total	22.8	37.3	39.9
Total aid amount			
Zero	22.2	33.2	44.6
Less than $1,000	18.3	28.8	52.9
$1,000–2,499	26.7	43.8	29.5
$2,500–4,999	26.4	47.4	26.2
$5,000 or more	23.3	54.0	22.7
Public institutions			
Total	21.5	37.0	41.5
Total aid amount			
Zero	21.2	33.5	45.2
Less than $1,000	17.9	28.8	53.3
$1,000–2,499	25.6	48.1	26.3
$2,500–4,999	23.6	53.4	23.0
$5,000 or more	22.8	54.9	22.3
Private, not-for-profit			
Total	23.1	42.6	34.3
Total aid amount			
Zero	27.8	31.8	40.4
Less than $1,000	17.0	29.3	53.6
$1,000–2,499	21.3	35.6	43.1
$2,500–4,999	22.2	46.9	30.9
$5,000 or more	19.1	59.9	21.0
Private, for-profit			
Total	38.5	28.4	33.1
Total aid amount			
Zero	35.0	27.4	37.6
Less than $1,000	30.2	26.6	43.2
$1,000–2,499	44.3	26.6	29.1
$2,500–4,999	40.1	27.8	32.1
$5,000 or more	38.8	32.0	29.3

NOTE: Percentages may not sum to 100 percent due to rounding.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1989–90 National Postsecondary Student Aid Study (NPSAS:90), Data Analysis System.

Figure 3.2b—Percentage distribution of undergraduates' employment status, according to the amount of financial aid they received, by attendance status: 1989–90



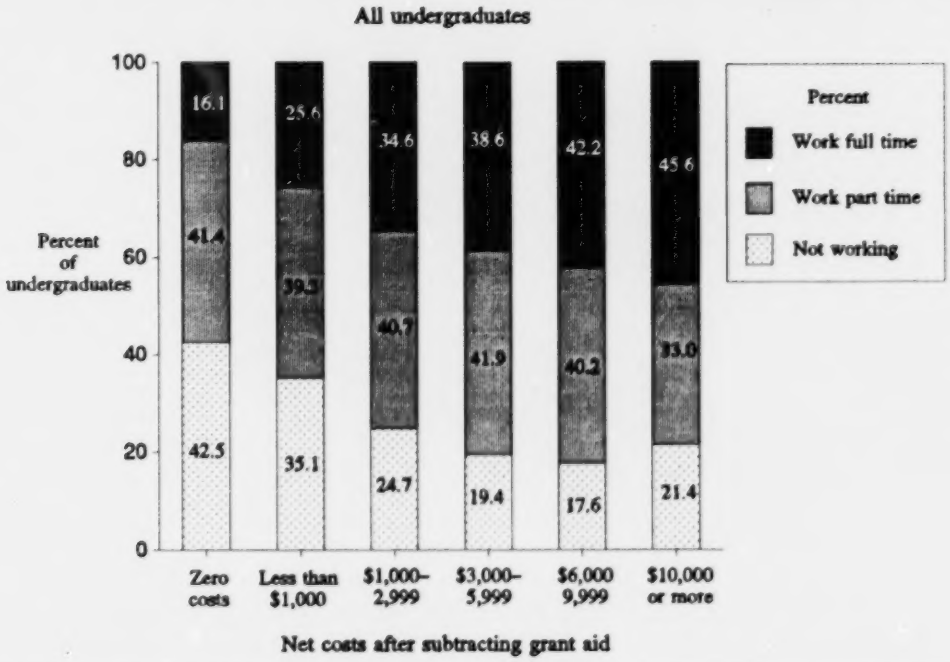
SOURCE: U.S. Department of Education, National Center for Education Statistics, 1989–90 National Postsecondary Student Aid Study (NPSAS:90), Data Analysis System.

Education Costs

In this analysis, undergraduates' net costs were determined by subtracting their grant awards from their total education costs. This is the amount of money that undergraduates (and their families in the case of dependents) would be responsible for providing toward their schooling through family contributions, employment earnings, or loans.

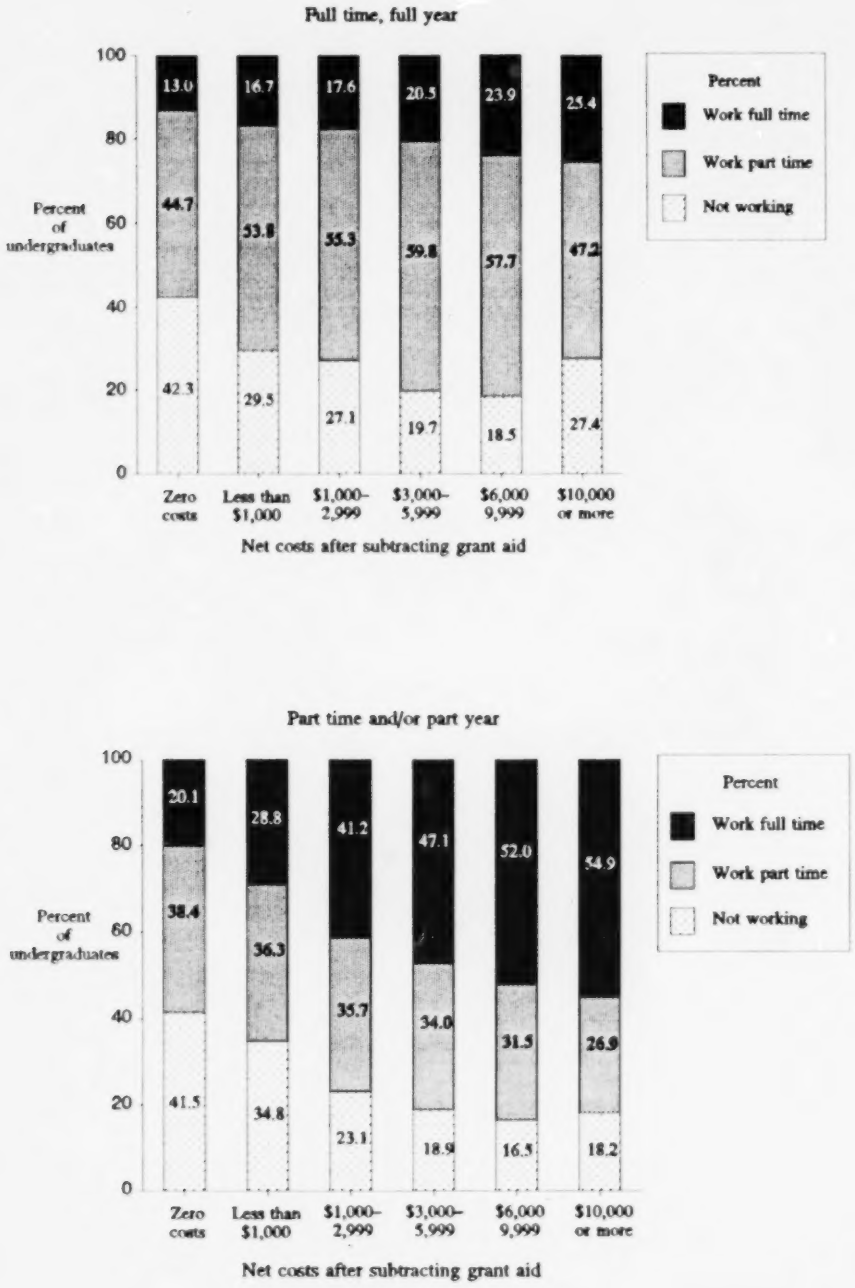
The relationship between net costs and employment intensity was the opposite of that seen for financial aid amount. Undergraduates with higher net costs were more likely to work and to work full time than were those whose net costs were lower (figures 3.3a and 3.3b, table 3.3). For example, among all undergraduates with net costs of less than $1,000, about 26 percent worked full time. This percentage increased to 39 percent for undergraduates with net costs between $3,000 and $5,999, and further increased to 46 percent for those with net costs of $10,000 or more.

Figure 3.3a—Percentage distribution of undergraduates' employment status while enrolled, according to their net costs after subtracting grant aid: 1989–90



SOURCE: U.S. Department of Education, National Center for Education Statistics, 1989–90 National Postsecondary Student Aid Study (NPSAS:90), Data Analysis System.

Figure 3.3b—Percentage distribution of undergraduates' employment status while enrolled, according to their net costs after subtracting grant aid, by attendance status: 1989–90



SOURCE: U.S. Department of Education, National Center for Education Statistics, 1989–90 National Postsecondary Student Aid Study (NPSAS:90), Data Analysis System.

Table 3.3—Percentage distribution of undergraduates' employment status according to their average total education costs minus total grant aid, by control of institution: 1989–90

	Not working while enrolled	Work part time while enrolled	Work full time while enrolled
	All undergraduates		
Total	22.8	37.3	39.9
Total costs minus grants			
Zero	42.5	41.4	16.1
Less than $1,000	35.1	39.3	25.6
$1,000–2,999	24.7	40.7	34.6
$3,000–5,999	19.4	41.9	38.6
$6,000–9,999	17.6	40.2	42.2
$10,000 or more	21.4	33.0	45.6
	Public institutions		
Total	21.5	37.0	41.5
Total costs minus grants			
Zero	41.3	42.6	16.1
Less than $1,000	34.8	39.5	25.7
$1,000–2,999	23.9	41.0	35.2
$3,000–5,999	17.9	42.1	40.0
$6,000–9,999	15.8	39.9	44.4
$10,000 or more	20.2	30.4	49.4
	Private, not-for-profit		
Total	23.1	42.6	34.3
Total costs minus grants			
Zero	42.3	41.7	16.0
Less than $1,000	32.7	40.0	27.3
$1,000–2,999	24.5	44.0	31.5
$3,000–5,999	21.1	45.5	33.4
$6,000–9,999	19.0	47.4	33.7
$10,000 or more	21.8	41.4	36.8
	Private, for-profit		
Total	38.5	28.4	33.1
Total costs minus grants			
Zero	59.1	23.5	17.4
Less than $1,000	51.1	30.2	18.7
$1,000–2,999	47.7	24.8	27.5
$3,000–5,999	42.7	32.5	24.8
$6,000–9,999	36.1	30.2	33.7
$10,000 or more	30.5	28.6	40.9

NOTE: Percentages may not sum to 100 percent due to rounding.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1989–90 National Postsecondary Student Aid Study (NPSAS:90), Data Analysis System.

Borrowing and Working

Not all undergraduates are eligible for loans and not all of those who are eligible actually borrow. In fact, only about 18 percent of undergraduates took out loans for their education in 1989–90 (Horn and Khazzoom 1992). In order to have a comparable sample of undergraduates who may or may not choose to borrow, only financial aid recipients who had financial need (after subtracting grants and expected family contribution (EFC) from costs) were considered for this particular analysis.[8] This group accounted for 26 percent of all undergraduates and 70 percent of financial aid recipients. These undergraduates presumably have some discretion in how much they choose to borrow or to work to fill this need.

Table 3.4 illustrates the relationship between borrowers and nonborrowers. Among all who may have been eligible for student loans, borrowers were more likely than nonborrowers to work part time (52 percent versus 39 percent) and were less likely to work full time (26 percent versus 37 percent). However, this particular relationship held only for part-time and/or part-year undergraduates (figure 3.4). Not only did borrowers attending full-time, full-year work part time more than nonborrowers (59 percent versus 53 percent), but also they were more likely to work in general than were nonborrowers. Full-time, full-year undergraduates are limited in terms of how much time they have available for work, and it appears that work was therefore not a substitute for borrowing, but rather was used in addition to borrowing to meet greater financial need than nonborrowers. On the other hand, part-time and/or part-year undergraduates may be more able to adjust their schedule to work more or less as needed. For these undergraduates, it does appear that those who borrowed were less likely to work full time (31 percent versus 46 percent) and were more likely to work part time (44 percent versus 32 percent) than were nonborrowers.

The overall relationship between work, financial aid, and borrowing is shown in figure 3.5. This figure illustrates several points. First, it shows that financial aid receipt had little association with whether or not undergraduates worked: about one-quarter (22 to 24 percent) of undergraduates did not work at any time during their enrollment in 1989–90, regardless of financial aid receipt. Second, for undergraduates who did work while they were enrolled, the receipt of financial aid reduced the likelihood of working full time. And third, among financial aid recipients with a need greater than their aid and EFC, borrowing further reduced the likelihood of working full time.

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[8]Total costs are student reported and are usually higher than the student budgets used in determining financial aid eligibility, so it is possible that not all of these students may have been eligible for need-based loans.

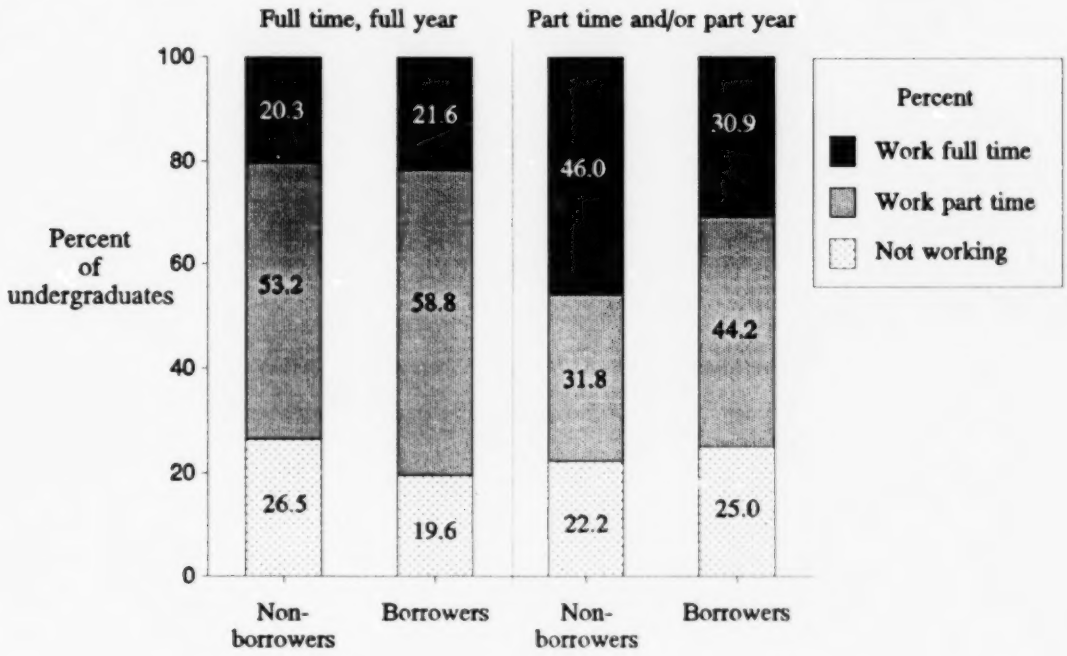
Table 3.4—Percentage distribution of employment status for undergraduate financial aid recipients who had need of at least $100 or more after subtracting their total grants and expected family contribution from their total aid: 1989–90

	Not working while enrolled	Work part time while enrolled	Work full time while enrolled
		All undergraduates	
Total	23.2	45.9	31.0
Education loans for 1989–90			
Did not borrow	24.1	39.3	36.6
Borrowed	22.4	51.6	26.0
		Full-time, full-year	
Total	22.1	56.8	21.1
Education loans for 1989–90			
Did not borrow	26.5	53.2	20.3
Borrowed	19.6	58.8	21.6
		Part-time and/or part-year	
Total	23.5	37.3	39.2
Education loans for 1989–90			
Did not borrow	22.2	31.8	46.0
Borrowed	25.0	44.2	30.9

NOTE: Percentages may not sum to 100 percent due to rounding.

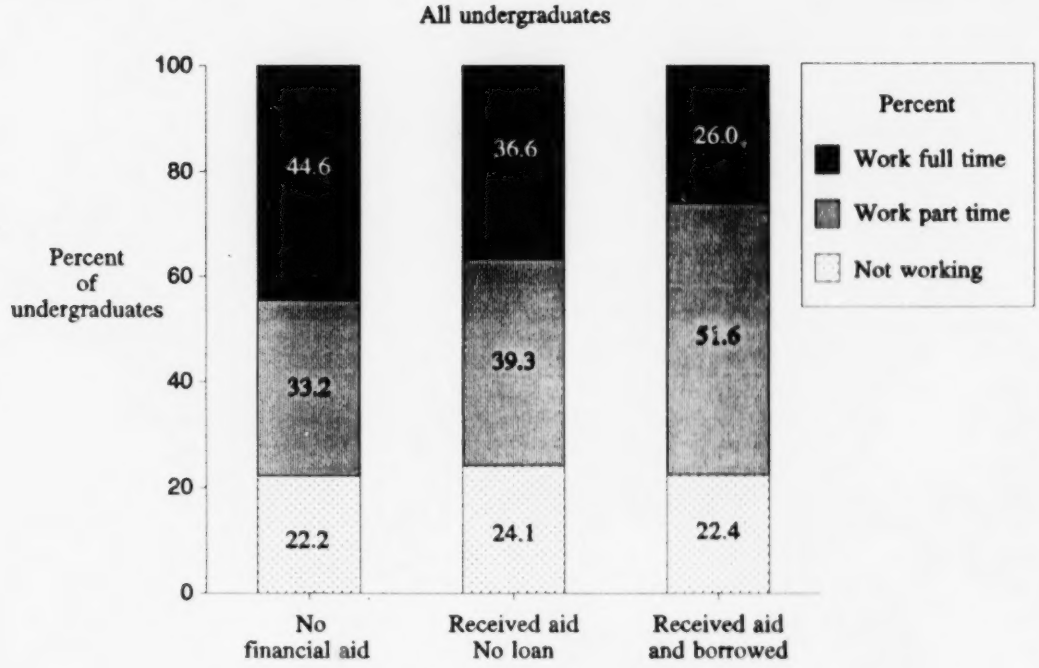
SOURCE: U.S. Department of Education, National Center for Education Statistics, 1989–90 National Postsecondary Student Aid Study (NPSAS:90), Data Analysis System.

Figure 3.4—Percentage distribution of undergraduate financial aid recipients whose net costs were greater than their grant aid and expected family contribution (EFC), according to whether they took student loans, by attendance status: 1989–90



SOURCE: U.S. Department of Education, National Center for Education Statistics, 1989–90 National Postsecondary Student Aid Study (NPSAS:90), Data Analysis System.

Figure 3.5—Percentage distribution of undergraduates' employment status while enrolled, according to their financial aid status and according to whether they took student loans: 1989–90



SOURCE: U.S. Department of Education, National Center for Education Statistics, 1989–90 National Postsecondary Student Aid Study (NPSAS:90), Data Analysis System.

Chapter 4

Undergraduate Employment, GPA, and Persistence

There were two education outcome measures available in NPSAS:90 that were examined relative to how much undergraduates worked in 1989–90. Cumulative grade point average (GPA) was used as a measure of academic performance, and full-time enrollment that continued for an entire academic year (at least 9 months) was used as a measure of attendance persistence. These two measures are discussed in turn in the following sections.

Cumulative Grade Point Average

For this analysis, cumulative GPA was divided into three categories: less than 3.0, 3.0–3.49, and 3.5 or higher. These correspond to an average grade of less than a B, B to B+, and B+ to A. The distribution of undergraduates who fell into these categories was examined according to their working intensity.

While there appears to be a trend of higher GPAs as working hours decline for full-time, full-year undergraduates, the only paired differences that were statistically significant were between students working 1–15 hours per week and those working more (figure 4.1).[9] For example, undergraduates who worked 1–15 hours per week were more likely to have high GPAs of 3.5 or higher (22 percent) than were those working more hours (14 to 17 percent). Full-time, full-year undergraduates who worked 1–15 hours per week also appeared to perform better than undergraduates who did not work while enrolled (for example, 57 percent of undergraduates not working had a GPA under 3.0, compared with 53 percent of undergraduates working 1–15 hours), but the difference was not statistically significant.

Similarly, for part-time and/or part-year undergraduates, when comparing undergraduates working 1–15 hours with those working 16–24 hours or 25–34 hours per week, the results followed those found for full-time, full-year undergraduates (table 4.1).[10]

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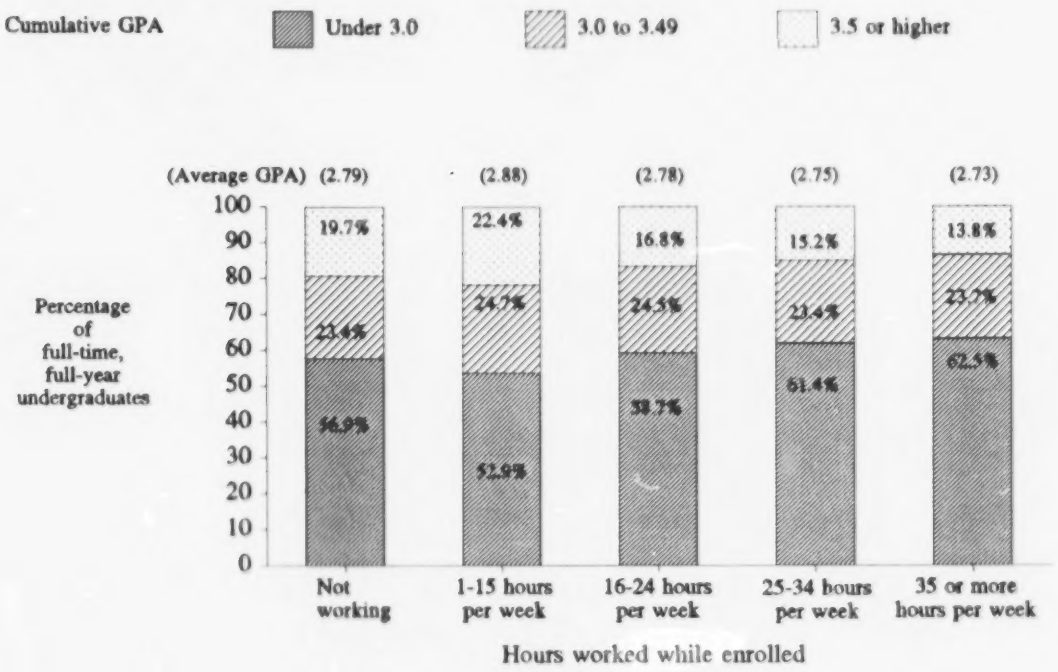
[9] A significant F-test ($p < .05$) was found using a one-way ANOVA for the average GPAs of students for each working category.

[10] Part-time and/or part-year students who worked full time appeared to have higher GPAs than students working from 16 to 34 hours per week. This is probably due to the fact that there are undergraduates in full-time career jobs who are attending school on a very part-time basis (e.g., a person who takes a class or two during the year).

Figure 4.1—Percentage distribution of full-time, full-year undergraduates' cumulative GPA and average GPA, by employment status while enrolled: 1989–90



SOURCE: U.S. Department of Education, National Center for Education Statistics, 1989–90 National Postsecondary Student Aid Study (NPSAS:90), Data Analysis System.

Table 4.1—Percentage distribution of undergraduates' cumulative GPA, according to how much they had worked while enrolled: 1989–90

	Under 3.0	3.0 to 3.49	3.5 or higher
		Full-time, full-year	
Total	58.6	23.9	17.5
Average hours worked per week			
Not working while enrolled	56.9	23.4	19.7
Work 1–15 hours per week	52.9	24.8	22.4
Work 16–24 hours per week	58.7	24.5	16.8
Work 25–34 hours per week	61.4	23.4	15.2
Work 35 or more hours per week	62.5	23.6	13.8
		Part-time and/or part-year	
Total	50.0	22.7	27.3
Average hours worked per week			
Not working while enrolled	48.2	21.6	30.1
Work 1–15 hours per week	48.5	22.9	28.6
Work 16–24 hours per week	57.0	21.9	21.1
Work 25–34 hours per week	59.3	22.4	18.3
Work 35 or more hours per week	46.6	23.5	29.8

NOTE: Percentages may not sum to 100 percent due to rounding.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1989–90 National Postsecondary Student Aid Study (NPSAS:90), Data Analysis System.

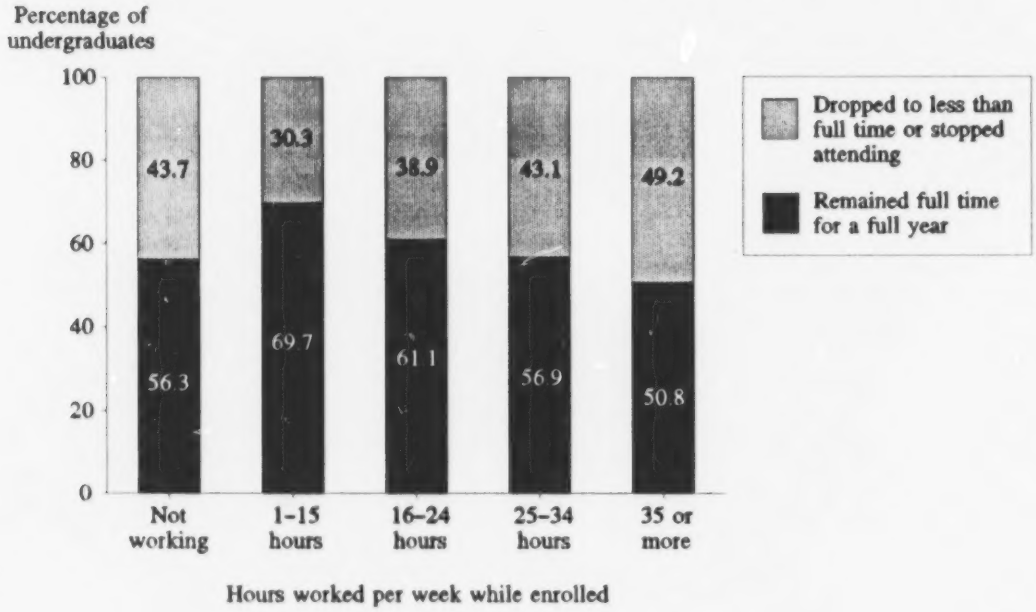
Persistence

Approximately 56 percent of undergraduates initially enrolled full time for their postsecondary studies in 1989–90 (the term in which they were sampled for NPSAS:90). However, only about one-third remained full time for the full academic year. Thus, about 42 percent of undergraduates who initially enrolled full time dropped to less than full-time attendance status or stopped attending in a subsequent term during the academic year. When these undergraduates were examined according to how much they worked while enrolled, it appeared that the more undergraduates worked, the more likely they were to drop from their full-time enrollment status at some point during the year (figure 4.2). For example, 70 percent of undergraduates working 1–15 hours per week while enrolled remained full time for the entire academic year, compared with 51 percent of undergraduates working 35 or more hours.[11] Moreover, it appears that undergraduates working 1–15 hours per week

[11]The difference in persistence between students working 16–24 hours per week and 25–34 hours per week was not significant.

were also more likely to persist as full-time undergraduates than were those who did not work at all while enrolled—56 percent of whom remained full time for a full year.

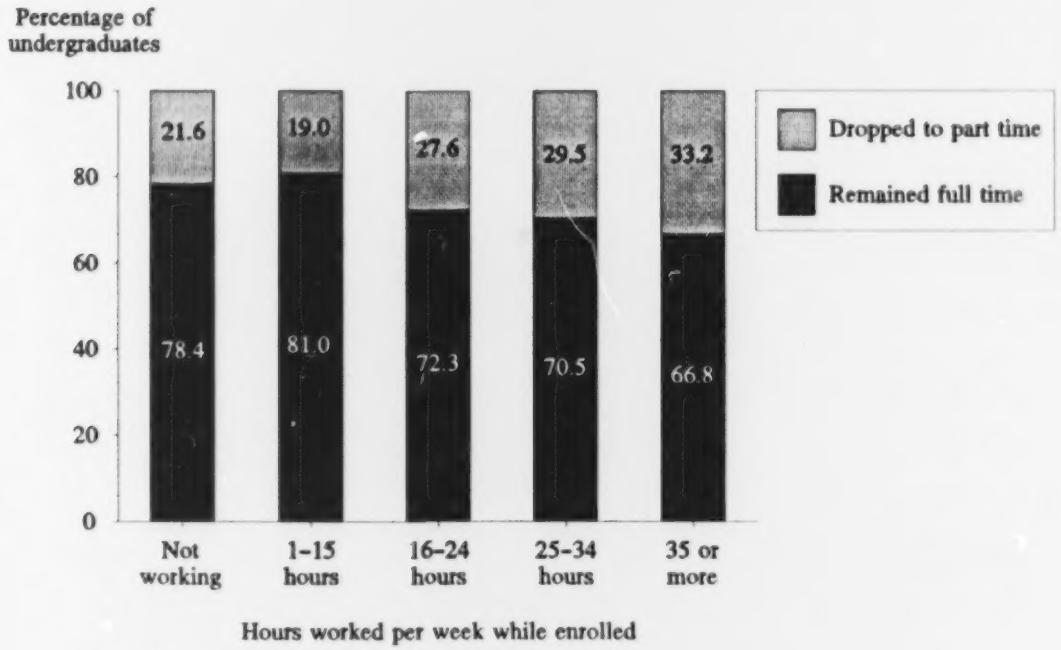
Figure 4.2—Percentage of undergraduates initially enrolled full time who dropped to less than full-time enrollment or who stopped attending, by average hours worked per week while enrolled: 1989–90



SOURCE: U.S. Department of Education, National Center for Education Statistics, 1989–90 National Postsecondary Student Aid Study (NPSAS:90), Data Analysis System.

It is possible that some undergraduates who stopped attending subsequent to their full-time enrollment may have done so because they finished their program or for other than financial considerations. However, even when all students who started full time and stopped attending before the end of the year were removed from the analysis, working intensity still had a negative influence on full-time enrollment persistence (figure 4.3). Thus, these results are consistent with other studies (discussed in chapter 1) showing the adverse effect of working long hours on persistence.

Figure 4.3—Percentage of undergraduates attending for a full academic year who initially enrolled full time who maintained full-time status or dropped to part-time, by average hours worked per week while enrolled: 1989–90



SOURCE: U.S. Department of Education, National Center for Education Statistics, 1989-90 National Postsecondary Student Aid Study (NPSAS:90), Data Analysis System.

Chapter 5

Adjustments for Background Variation

The previous chapters have compared averages or proportions of undergraduates in relation to their working status while enrolled in postsecondary education. Differences important to the topic were highlighted and discussed. To compensate for differences in populations, wherever possible, the populations were subdivided (e.g., into full-time or part-time enrollments) and cross-tabulated into various strata (e.g., by gender, age, institution type, income group, financial aid amount, and so on). This approach of controlling for group differences by cross-tabulation has limitations with survey data, since sample size limits the number of cells that can usefully subdivide the data.

The limitations imposed by sample size are unavoidable and linear models are frequently used to examine several sets of variables simultaneously. This chapter proposes one such model (linear regression) to estimate these effects (adjusted means).[12] The regression model is used to take into account the effect of all variables simultaneously and, hence, to control for overlapping effects that can affect tabular findings. By estimating the joint effect of all variables taken together, regression models are often used to test individual parameters while "holding constant" the influence of other variables.

In chapter 2 of this report, for example, a number of institutional and student characteristics were found to be associated with undergraduates' employment status while enrolled in postsecondary education. These characteristics included attendance status, control and level of institution, gender, race–ethnicity, age, financial dependency status, and marital status. However, several of these variables are interrelated and the findings from the tables cannot always take this into account.

For instance, as reported in an earlier NCES publication, most less-than-2-year institutions (75 percent) are privately controlled, for-profit institutions (Horn and Khazzoom 1992). The same publication also showed that a greater proportion of black and Hispanic students attended these institutions than non-Hispanic white students. Another characteristic shown to be related to institution level was age: older students were more likely to attend community colleges (public 2- to 3-year institutions) than were younger students. It follows, then, that the differences found for institution level in the tables may be due to related variables such as institution control, age, and race–ethnicity. For example, table 2.1 shows that undergraduates in less-than-2-year institutions were less likely to work than students attending other institutions and that those attending 2- to 3-year institutions were more likely to work full time while enrolled than students in other level institutions. The differences in table 2.1 may actually be related to institution control and student age and race–ethnicity rather than to institution level.

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[12]See appendix B for means adjustment method.

In fact, this hypothesis was borne out by the regression model. When all parameters were fitted, institution level was no longer significant in relation to either the proportion of undergraduates who worked while enrolled, or to the proportion who worked full time. This indicates that the different distributions of other variables at each institution level accounted for the apparent differences ascribed to level of institution. Thus this variable was redundant and removed from the model.

In order to investigate whether specific findings discussed earlier using tabular analyses may owe some of their statistical significance to their association with other variables, regressions of relevant variables were conducted on:

- The proportion of undergraduates who worked;
- Among students who worked while enrolled, the proportion who worked full time; and
- Among students who initially enrolled full time, the proportion who persisted full time for the full year.

The models were reduced by removing redundant variables (such as institution level as discussed above).[13] The regression coefficients were then used to adjust the means (in this case, proportions).

Table 5.1 shows the adjusted proportions of undergraduates who worked while enrolled in postsecondary education when taking into account the variation of the variables listed in the table (the unadjusted means are included for comparison). Most of the subgroup differences found in the tabular analysis were still apparent in the adjusted proportions. For example, as found in chapter 2 (table 2.1), undergraduates who attended private, for-profit institutions were less likely to work than were those in public institutions.

Initial differences found for gender and racial-ethnic groups (table 2.8) also held after controlling for background variation: women were less likely than men to work while enrolled, and Asian students were less likely to work than white students.

Since a majority of 1989-90 undergraduates worked at one time or another during their enrollment, most of the findings in this report reflected differences in working intensity (i.e., the proportion who worked full or part time) rather than working in general. Therefore, table 5.2 shows the adjusted proportions for working full time among students who worked after controlling for background variation.

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[13] See the note at the bottom of each table in this chapter to see which variables were removed from the initial model.

Table 5.1—Percentage of undergraduates who worked while enrolled in postsecondary education, and the adjusted percentage taking into account the covariation of variables listed in the table[1]

	Un-adjusted means[2]	Adjusted means[3]	WLS coefficient[4]	Standard error[5]
Total	77.20		0.927	
Age				
24 to 29 years	78.88	76.58	-0.040	0.010 **
30 years or older	72.24	69.88	-0.107	0.017 **
23 or younger	79.02	80.62		
Financial aid amount				
No aid	77.80	76.82	-0.017	0.020
Less than $1,000	81.72	81.62	0.031	0.017
$1000-$2499	73.26	75.29	-0.032	0.013 *
$2500-$4999	73.58	75.95	-0.025	0.014
$5000 or more	76.68	78.47		
Attendance status				
Full-time full-year	76.33	73.04	-0.058	0.012 **
Part-time and/or part-year	78.71	78.87		
Control of institution				
Private, not-for-profit	76.92	76.25	-0.026	0.016
Private, for-profit	61.48	64.12	-0.148	0.024 **
Public	78.47	78.88		
Total cost of attendance				
Less than $3,000	72.28	67.59	-0.111	0.011 **
$3,000-5,999	80.38	77.05	-0.016	0.008 *
$6,000-11,999	81.26	79.42	0.007	0.007
$12,000 or more	78.09	78.69		
Citizenship				
Eligible noncitizen	70.33	73.78	-0.040	0.022
Other	44.77	48.09	-0.297	0.019 **
Citizen	78.54	77.76		
Dependency status				
Dependent	75.79	75.38	-0.035	0.017 *
Independent	78.76	78.88		
Income percentile ranking				
Lower 25th	69.44	70.88	-0.087	0.007 **
Upper 25th	77.92	78.43	-0.012	0.008
Middle 50 percent	80.00	79.59		
Gender				
Female	75.17	74.89	-0.052	0.005 **
Male	81.14	80.07		
Loan Status				
Borrowed for education	76.59	80.41	0.039	0.016 *
Did not borrow	77.32	76.46		

C1

Table 5.1—Percentage of undergraduates who worked while enrolled in postsecondary education, and the adjusted percentage taking into account the covariation of variables listed in the table[1]—Continued

	Un-adjusted means[2]	Adjusted means[3]	WLS coefficient[4]	Standard error[5]
Local Residence				
Campus housing	74.91	73.74	-0.025	0.017
With parents	80.54	80.87	0.046	0.011 **
Off campus	76.10	76.29		
Marital status				
Married	76.98	75.96	-0.018	0.011
Separated	67.63	72.56	-0.052	0.016 **
Single	79.46	77.76		
Race-ethnicity				
American Indian	76.73	77.44	-0.006	0.022
Asian/Pacific Islander	67.33	70.68	-0.073	0.019 **
Black, non-Hispanic	70.15	73.85	-0.042	0.019 *
Hispanic	75.59	77.64	-0.004	0.019
White, non-Hispanic	78.75	78.00		
Undergraduate level				
2nd year–sophomore	79.61	78.63	0.027	0.007 **
3rd year–junior	80.29	78.80	0.028	0.009 *
4th year–senior	79.07	77.91	0.019	0.012
5th year–higher	78.25	79.15	0.032	0.038
1st year–freshman	74.80	75.96		

[1]Last group in each category is reference group for comparison (blank entries).
[2]Estimates from NPSAS:90 NCES Data Analysis System.
[3]Proportions adjusted for differences in the proportion working associated with differences in other variables in the table (see appendix B for details).
[4]Weighted least squares regression coefficient.
[5]Standard error of regression coefficient adjusted for design effect (see appendix B for details).
* $p <= .05$
** $p <= .01$

NOTE: Institution level was a redundant variable (no significant differences) and removed to produce the reduced model.

Some of the student characteristics initially found to be associated with the likelihood of working full time changed in the regression analysis and were therefore removed from the model (see the note on the bottom of table 5.2 for a list of the variables that were removed from the model). For example, it was initially found that Asian students were less likely than white students to work full time while enrolled (table 2.8). However, Asian students tend to be younger and more often financially dependent than white students (Horn and Khazzoom 1992). When these variables were taken into account, the racial-ethnic group differences originally found to be significant disappeared. The same was true of marital status, probably for the same reasons. The initial finding indicated that married students were more likely to work full time than unmarried students. However, similar to Asian students, unmarried students are younger and more often financially dependent—thus, when these variables were factored into the model marital status was no longer associated with the likelihood of working full time.

On the other hand, the gender difference discussed in chapter 2, which indicated that men were more likely to work full time while enrolled than women (table 2.8) persisted in the regression model. In fact, the adjusted means shown in table 5.2 changed little when other variables were taken into account. Similarly, the differences associated with age, dependency status, and attendance status also persisted in the regression analysis, though the magnitude of the differences (that is, the difference between the lowest and highest proportions) was reduced. The change for attendance status (i.e., the reduction in the difference between full-time, full-year undergraduates and those attending part time and/or part year) is especially notable. The unadjusted proportions were 29 percent versus 61 percent working full time, while the adjusted proportions were 40 percent versus 56 percent. This change reflects the different nature of the student populations attending full time, full year compared to those attending less time. The former are more likely to be younger, financially dependent on their parents, and to attend 4-year institutions. The latter, on the other hand, are more likely to be returning students who attend primarily community colleges (Horn and Khazzoom 1992). When these characteristics are factored into the model, the difference between these groups in the likelihood of working full time, while still significant, narrowed substantially.

Table 5.2 also shows the adjusted proportions of full-time workers for increasing levels of financial aid. The original finding discussed in chapter 3 that showed increasing levels of financial aid accompanied by decreasing proportions of students working full time held in the regression model. Again, however, when controlling for related factors (e.g., cost of attendance), the magnitude of the difference narrowed.

On the other hand, the relationship initially found between *net* cost of attendance and working intensity (increasing net costs associated with an increased likelihood of working full time), did not appear to hold for *total* cost of attendance. In the tabular analysis, net cost (total cost minus grant aid) was used in place of total cost to take into account differential levels of income and need (reflected in the amount of grant aid awarded) which could not be controlled for in the tables. However, in the regression model, both income and financial aid were taken into account. Therefore, total cost of attendance was the appropriate indicator of cost. Nevertheless, it appears that after removing the variation associated with income and financial aid (as well as other variables), the association between costs and working full time disappears (no significant differences were found among the cost categories, so it was removed from the model).

Borrowing for one's education, however, continued to be associated with a lower rate of working full time when controlling for background variation.[14] Again, however, even though significantly different, the magnitude of the difference between borrowers and nonborrowers declined.

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[14]Note that the unadjusted means presented in the chapter 5 tables for borrowers and nonborrowers are not exactly equivalent to those presented in table 3.4 in which the sample was limited to financial aid recipients who had a financial need greater than their grant awards and expected family contribution. However, since financial aid and income were taken into account in the regression model, no such limitation was imposed on the sample for the regression analysis.

Table 5.2—Among undergraduates who worked while enrolled in postsecondary education, the percentage of undergraduates who worked full time, and the adjusted percentage taking into account the covariation of variables listed in the table[1]

	Un-adjusted means[2]	Adjusted means[3]	WLS coefficient[4]	Standard error[5]
Total	51.67		0.658	
Age				
24 to 29 years	65.97	53.61	0.051	0.013 **
30 years or older	74.38	57.86	0.093	0.021 **
23 or younger	38.14	48.56		
Financial aid amount				
No aid	57.30	54.10	0.120	0.024 **
Less than $1,000	64.79	57.49	0.154	0.022 **
$1000–$2499	40.24	45.39	0.033	0.016 *
$2500–$4999	35.64	45.73	0.036	0.016 *
$5000 or more	29.55	42.08		
Attendance status				
Full-time full-year	29.20	40.04	-0.164	0.015 **
Part-time and/or part-year	61.27	56.45		
Control of institution				
Private, not-for-profit	44.59	55.72	0.051	0.018 **
Private, for-profit	53.81	57.22	0.066	0.028 *
Public	52.86	50.58		
Dependency status				
Dependent	34.98	42.82	-0.175	0.020 **
Independent	68.01	60.32		
Income percentile ranking				
Lower 25th	35.97	42.15	-0.117	0.009 **
Upper 25th	58.60	53.82	0.000	0.008
Middle 50 percent	53.51	53.87		
Gender				
Female	46.49	45.98	-0.123	0.007 **
Male	57.49	58.23		
Loan status				
Borrowed for education	33.03	47.78	-0.047	0.018 **
Did not borrow	55.36	52.44		
Local Residence				
Campus housing	33.11	53.41	-0.008	0.020
With parents	40.65	46.18	-0.080	0.013 **
Off campus	62.19	54.17		

Table 5.2—Among undergraduates who worked while enrolled in postsecondary education, the percentage of undergraduates who worked full time, and the adjusted percentage taking into account the covariation of variables listed in the table[1]—Continued

	Un-adjusted means[2]	Adjusted means[3]	WLS coefficient[4]	Standard error[5]
Undergraduate level				
2nd year–sophomore	51.13	51.47	-0.027	0.008 **
3rd year–junior	44.81	49.35	-0.048	0.012 **
4th year–senior	43.08	45.18	-0.089	0.014 **
5th year–higher	62.83	52.24	-0.019	0.040
1st year–freshman	55.69	54.13		

[1]Last group in each category is reference group for comparison.
[2]Estimates from NPSAS:90 NCES Data Analysis System.
[3]Proportions adjusted for differences in the proportion working full time associated with differences in other variables in the table (see appendix B for details).
[4]Weighted least squares regression coefficient.
[5]Standard error of regression coefficient adjusted for design effect (see appendix B for details).
* $p <= .05$
** $p <= .01$

NOTE: The variables total cost, citizenship, institution level, marital status, and race–ethnicity were redundant (no significant differences) and removed to produce the reduced model.

Finally, the relationship discussed in chapter 4 (table 4.3) between working while enrolled and persisting full time for a full year is still clearly shown in the adjusted means in table 5.3. The more students worked, the less likely they were to continue their full-time enrollment for a full year. With the exception of students who worked 1–15 hours per week, the adjusted means were relatively similar to the unadjusted estimates.

Table 5.3—Among undergraduates who enrolled full time in postsecondary education, the percentage of those who persisted full time for a full year, and the adjusted percentage taking into account the covariation of variables listed in the table[1]

	Un-adjusted means[2]	Adjusted means[3]	WLS coefficient[4]	Standard error[5]
Total	57.86		0.798	
Employment while enrolled				
Not working	56.34	60.44	0.081	0.007 **
Work 1–15 hours	69.69	63.46	0.111	0.008 **
Work 16–24 hours	61.07	58.91	0.065	0.007 **
Work 25–34 hours	56.90	56.31	0.039	0.007 **
Work 35 or more hours	50.85	52.37		
Age				
24 to 29 years	43.03	53.33	-0.060	0.012 **
30 years or older	39.65	52.70	-0.066	0.015 **
23 or younger	62.56	59.35		
Financial aid amount				
No aid	54.06	50.80	-0.183	0.017 **
Less than $1,000	49.40	51.61	-0.175	0.015 **
$1000-$2499	54.93	58.51	-0.106	0.013 **
$2500-$4999	60.79	65.26	-0.038	0.012 **
$5000 or more	70.80	69.07		
Control of institution				
Private, not-for-profit	69.02	51.60	-0.108	0.019 **
Private, for-profit	31.87	43.90	-0.185	0.030 **
Public	57.67	62.40		
Total cost of attendance				
Less than $3,000	37.83	35.59	-0.342	0.014 **
$3,000-5,999	54.85	50.43	-0.194	0.010 **
$6,000-11,999	60.90	59.92	-0.099	0.008 **
$12,000 or more	64.54	69.78		
Dependency status				
Dependent	64.77	61.08	0.093	0.018 **
Independent	42.76	51.74		
Income percentile ranking				
Lower 25th	54.98	57.23	-0.015	0.008
Upper 25th	60.28	56.78	-0.019	0.009 *
Middle 50 percent	58.16	58.71		
Institution level				
Less-than-4-year	41.61	52.10	-0.091	0.023 **
4-year	66.53	61.24		
Loan status				
Borrowed for education	56.25	54.91	-0.042	0.014 **
Did not borrow	62.01	59.11		

Table 5.3—Among undergraduates who enrolled full time in postsecondary education, the percentage of those who persisted full time for a full year, and the adjusted percentage taking into account the covariation of variables listed in the table[1]—Continued

	Un-adjusted means[2]	Adjusted means[3]	WLS coefficient[4]	Standard error[5]
Local Residence				
Campus housing	75.95	67.24	0.138	0.016 **
With parents	52.07	56.32	0.028	0.013 *
Off campus	50.94	53.48		
Marital status				
Married	40.85	50.37	-0.088	0.011 **
Separated	31.36	52.47	-0.066	0.022 **
Single	60.84	59.12		
Race-ethnicity				
American Indian	57.75	59.62	0.008	0.031
Asian/Pacific Islander	56.74	54.44	-0.053	0.016 *
Black, non-Hispanic	50.33	55.06	-0.037	0.020
Hispanic	49.61	55.40	-0.034	0.021
White, non-Hispanic	59.37	58.78		
Undergraduate level				
2nd year–sophomore	61.01	58.94	0.000	0.008
3rd year–junior	66.14	57.35	-0.016	0.009
4th year–senior	60.20	54.13	-0.048	0.011 **
5th year–higher	49.24	47.84	-0.111	0.027 **
1st year–freshman	52.57	58.96		

[1]Last group in each category is reference group for comparison.
[2]Estimates from NPSAS:90 NCES Data Analysis System.
[3]Proportions adjusted for differences in the proportion persisting full time for a full year associated with differences in other variables in the table (see appendix B for details).
[4]Weighted least squares regression coefficient.
[5]Standard error of regression coefficient adjusted for design effect (see appendix B for details).
* $p <= .05$
** $p <= .01$

NOTE: The variables citizenship and gender were redundant (no significant differences) and removed from the model.

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Appendix A

Glossary

This glossary describes the variables used in this report. These variables were taken directly from the PEDAR undergraduate Data Analysis System (DAS), an NCES software application that generates tables from the NPSAS:90 data. A description of the DAS software can be found in appendix B.

Employment Variables

Average Number of Hours Worked Per Week While Enrolled in 1989–90 (EMWKHR3)

This variable represents the average number of hours worked per week (including work-study and assistantships) during those months when a student was enrolled for at least part of the month. If a student reported being employed during the month, the average number of hours worked per week was derived based on the starting and ending dates and the hours reported for each job during the survey interview. Note that this variable only represents the average hours a student worked *while working and enrolled.* Thus, if a student worked an average of 20 hours per week while enrolled for 6 months and then did not work for the remaining 3 months of enrollment, the average hours would still be 20 hours per week. In order to determine the duration of employment *and* enrollment (e.g., whether or not students were employed the whole time they were enrolled or only for part of their enrollment), a ratio of employment and enrollment was calculated to express the average percentage of time a student was both employed and enrolled over their total time of enrollment. (See "employment/enrollment ratio" below for a description.)

No work while enrolled	Student reported no hours of work during months of enrollment.
Work 1–15 hour/week	Student reported working an average of 1 to 15 hours per week while enrolled.
Work 16–24 hours/week	Student reported working an average of 16 to 24 hours per week while enrolled.
Work 25–34 hours/week	Student reported working an average of 25 to 34 hours per week while enrolled.

Work 35 or more hours	Student reported working an average of 35 or more hours per week while enrolled.
Work part time	Student reported working an average of 1 to 34 hours per week while enrolled.
Work full time	Student reported working an average of 35 or more hours while enrolled.

Employment/Enrollment Ratio (EM2ENRL)

This variable represents the ratio (expressed as a percentage) of the number of months a student was both employed *and* enrolled to the total number of months of enrollment from July 1, 1989 to June 30, 1990. A value of 100 indicates that for all months a student was enrolled, the student was also employed for at least part of the month. Note that it is possible that employment and enrollment during any given month may not be concurrent. Because the beginning and ending dates are only recorded as months and years, it is not possible to determine the specific overlap between enrollment and employment when both activities begin or end in the same month.

Number of Jobs 1989–90 (JOBNUM)

This variable represents the total number of jobs reported (including work-study and assistantships) by a student between July 1, 1989 and June 30, 1990. Note that jobs may or may not be concurrent.

No job
One job
Two jobs
Three or more jobs

Employment period (EMPLPRD)

No employment	Student did not report work at any job in AY 1989–90.
Outside school period	Student reported working only while not enrolled in school in AY 1989–90.
Inside school period	Student reported working only while enrolled in school in AY 1989–90.
Employed at all times	Student reported being employed inside and outside during the period enrolled in school in AY 1989–90.

Attendance Status

Persistence Status (ATTNST3)

This variable represents students' enrollment (reported by the student) over the entire academic year (9 months).

Full-time, full-year	This category includes students who were enrolled full time for 9 months. Note that this category may exclude some students enrolled full time in a private, for-profit institution if the program is shorter than 9 months.
Part-time and/or part-year	This category includes students who were not enrolled full time for a full year. Thus, it includes students enrolled full time for one term and part time for an entire year, and students enrolled full time or part time for one term and not enrolled for a second.

Intensity (ATTEND)

This variable represents the enrollment status reported by the institution for each student in the first term enrolled (sampled term). It is often included as a row in tables of part-time and/or part-year students.

Full-time	Student was enrolled full time according to the institution's definition of full-time enrollment during the sampled term.
At least half-time	Student was enrolled part time at least half time or more according to the institution's definition of part-time enrollment during the sampled term.
Less than half-time	Student was enrolled less than half time according to the institution's definition of part-time enrollment during the sampled term.

Institutional Characteristics

Control of institution (CONTROL)

Public	A postsecondary education institution operated by publicly elected or appointed officials in which the program and activities are under the control of these officials and which is supported primarily by public funds.

Private, not-for-profit	A postsecondary institution that is controlled by an independent governing board and incorporated under section 501(c)(3) of the Internal Revenue Code.
Private, for-profit	A postsecondary institution that is privately owned and operated as a profit-making enterprise. Includes career colleges and proprietary institutions.

Level of institution (TYPE)

Less-than-2-year	Institution where all of the programs are less than 2 years in duration. The institution must offer a minimum of one program of at least 3 months in duration that results in a terminal certificate or license or is creditable toward a formal 2-year or higher award.
2- to 3-year	Institution that confers at least a 2-year formal award (certificate or associate's degree) or offers a 2- or 3-year program that partially fulfills requirements for a baccalaureate or higher degree at a 4-year institution. The institution does not award a baccalaureate degree. These would include most community or junior colleges.
4-year nondoctoral-granting	Institution or subsidiary element that confers at least a baccalaureate degree in one or more programs, but does not award higher than a master's degree.
4-year doctoral-granting	Institution that confers a doctoral or first professional degree in one or more programs.

Type of institution (OFCON1) (combination of institution "level" and "control" defined above)

Public less-than 2-year	Public less-than-2-year institution.
Public 2- to 3-year	Public 2- to 3-year institution.
Public 4-year non-doctoral-granting	Public 4-year institution not offering doctoral degrees.
Public 4-year doctoral-granting	Public 4-year institution offering doctoral degrees.

Private, not-for-profit less-than-2-year	Private independent less-than-2-year institution.
Private, not-for-profit 2- to 3-year	Private independent 2- to 3-year institution.
Private, not-for-profit 4-year nondoctoral-granting	Private independent 4-year institution not offering doctoral degrees.
Private, not-for-profit 4-year doctoral-granting	Private independent 4-year institution offering doctoral degrees.
Private, for-profit less-than-2-year	Private, for-profit less-than-2-year institution.
Private, for-profit 2-year or more	Private, for-profit 2-year or more institution.

Undergraduate Degree Program (PRGOTYP)

Type of program undergraduate was enrolled in during the 1989–90 academic year.

Associate's degree	Student pursuing an associate's degree.
Bachelor's degree	Student pursuing a Bachelor of Arts or Bachelor of Science degree.
Undergraduate's certificate	Student pursuing a certificate or other formal program other than an associate's or bachelor's degree.
Other undergraduate	Student is not in any of the above programs.

Student Characteristics

Gender of student (GENDER)

Male

Female

Race-ethnicity (RACE)

Asian	A person having origins in any of the Pacific Islander original peoples of the Far East, Southeast Asia, the Indian Subcontinent, or Pacific Islands. This includes people from China, Japan, Korea, the Philippine Islands, Samoa, India, and Vietnam.
Black, non-Hispanic	A person having origins in any of the black racial groups of Africa, not of Hispanic origin.
Hispanic	A person of Mexican, Puerto Rican, Cuban, Central or South American, or other Spanish culture or origin, regardless of race.
American Indian	A person having origins in any of the original peoples of North America and who maintains cultural identification through tribal affiliation or community recognition.
White, non-Hispanic	A person having origins in any of the original peoples of Europe, North Africa, or the Middle East (except those of Hispanic origin).

Age as of 12/31/89 (AGE)

This is a continuous variable in the table generator that was aggregated to the following categories:

23 years old or younger	Student was 23 years old or younger as of 12/31/89.
24 to 29 years old	Student was between 24 and 29 years old as of 12/31/89.
30 years old or older	Student was 30 years old or older as of 12/31/89.

Dependency status (DEPEND)

Dependent	Students were financially dependent if they did not meet any of the criteria for independence (see below).
Independent	A student was considered independent by meeting one of the following criteria:

- 24 years of age by December 31 of the academic year;
- a military veteran;

- a ward of the court or both parents are deceased;
- has legal dependents other than a spouse;
- is married or a graduate student and not claimed as a tax exemption for the calendar year coinciding with the beginning of the academic year; and
- is a single undergraduate but not claimed as a tax exemption for the 2 years previous to the beginning of the academic year and has at least $4,000 in financial resources.

Income and dependency level (INCOME)

The source of income for dependent students is their parents or guardians, whereas the source of independent students' income refers to their own assets or earnings including those of their spouse if they are married. Incomes in NPSAS:90 were derived from three sources: institutional records, parental reports, and student reports (in priority order).

Dependent students

Less than $10,000	Income of less than $10,000 in 1989.
$10,000 to $19,999	Income between $10,000 and $19,999 in 1989.
$20,000 to $29,999	Income between $20,000 and $29,999 in 1989.
$30,000 to $39,999	Income between $30,000 and $39,999 in 1989.
$40,000 to $49,999	Income between $40,000 and $49,999 in 1989.
$50,000 to $59,999	Income between $50,000 and $59,999 in 1989.
$60,000 or more	Income of $60,000 or more in 1989.

Independent students

Less than $5,000	Income of less than $5,000 in 1989.
$5,000 to $9,999	Income between $5,000 and $9,999 in 1989.
$10,000 to $19,999	Income between $10,000 and $19,999 in 1989.
$20,000 or more	Income of $20,000 or more in 1989.

Income percentile (FAMINCPR)

Income percentile ranks (used only in chapter 5) are calculated separately for dependent and independent students. For dependent students, the percentile rank is based on family income (DEPINC); for independents, it is based on the independent student's income (INDEPINC).

Lower 25th percentile	Income falls at or below the lowest quartile of undergraduates' income distribution.
26th to 75th percentile	Income falls between the 25th and 75th percentile of undergraduates' income distribution.
Upper 25th percentile	Income falls at or above the 75th percentile of undergraduates' income distribution.

Level of undergraduate class (UGRDLVL1)

Level is based on the number of credits earned, not the number of years the student has attended.

1st year–freshman	Student's level was freshman or first year.
2nd year–sophomore	Student's level was sophomore or second year.
3rd year–junior	Student's level was junior or third year.
4th year–senior	Student's level was senior or fourth year.
5th year–undergrad.	Student's level was fifth-year undergraduate.

Housing arrangements (LOCALRES)

Campus housing	Institution-owned living quarters for students. These are typically on-campus or off-campus dormitories, residence halls, or other facilities.
Off campus	Student lived off campus in noninstitution-owned housing but not with his or her parents.
With parents	Student lived at home with parents.

Field of study (MAJORS1)

NCES-coded majors were reported on the Student Record by a 2-digit Classification of Instructional Programs (CIP) code. For the purpose of this report, the majors were aggregated as follows:

Business/marketing	Business and management; accounting; finance; administrative support; marketing and distribution; legal assisting.
Health	Allied health; pre-med; health sciences and nursing.
Trades and industry	Construction trades; mechanics and repairers; precision production; transportation; cosmetology.
Tech. engineering	Computer sciences; engineering; engineering and related technologies; science technologies; architecture and environmental design.
Educ./public service	Education; library and archival sciences; military sciences; parks and recreation; protective services.
Communications	Communications technologies; journalism; communications.
Letters & languages	Foreign languages; letters.
Humanities	Philosophy and religion; history; English; liberal arts; theology; area and ethnic studies.
Science and math	Life sciences; mathematics; physical sciences.
Social science	Psychology; public affairs; social sciences.
Fine arts	Visual and performing arts.
Other	Agriculture; home economics; basic skills.

Student occupations (STUOCC1)

Marketing	Marketing (including sales and sales clerks).
Administrative support	Administrative support (including clerical).
Service	Service occupations; social/recreational positions.
Executive/managers	All managerial and executive positions.

Education	Postsecondary instructor and other education positions.
Professional/ technical	Engineering; scientist; computer scientist; writers/artists.
Technician	Technician (including medical or health technology).
Blue collar	Trade and other blue collar occupations.

Citizenship (CITZNSHP)

Citizen	Student was a U.S. citizen.
Eligible non-citiz.	Student was not a citizen of the United States but satisfied the requirements to be eligible for financial aid. An example of an eligible noncitizen would be a person with permanent residence status.
Other	Student was not a citizen of the United States and was not eligible for federal financial aid. An example would be a student who had been granted temporary residence in the United States (e.g., on a student visa).

Financial Aid and Cost Variables

Received Financial Aid (Total Aid Amount—TOTAID)

Student received financial assistance during the period July 1989 to June 1990 in the form of grants, loans, or work from sources other than family or self to help finance student's education. Students receiving aid were identified by the TOTAID variable having a positive value.

Received Aid	Total amount of aid greater than or equal to $100.
No financial Aid	Total amount of aid less than $100.
Total Aid Amount	TOTAID variable aggregated into predefined amount categories.

Zero (no aid)
Less than $1,000
$1,000–2,499
$2,500–4,999
$5,000 or more

Net Costs (Total Costs Minus Total Grant Amount—PRICE1)

The student's total cost of attending postsecondary education (see definition of total cost below) after subtracting the total amount of grant aid received. Costs presented are aggregated from the PRICE1 variable into the following categories:

Zero costs
Less than $1,000
$1,000–2,999
$3,000–5,999
$6,000—9,999
$10,000 or more

Total costs (TOTCOST)

Total student costs for 1989-90 (used only in chapter 5). The sum of costs reported for tuition (TUITCOST), room and board (ROOMCOST), books (BOOKCOST), and other off-campus costs (OTHRCOST, OTHRMCOST, OFFCOST). Costs were aggregated into the following categories:

Less than $3,000
$3,000-5,999
$6,000-11,999
$12,000 or more

Borrowers and Nonborrowers (combination of TOTAID, RNEED6, TOTCOST, and TOTLOAN)

In order to compare borrowers with nonborrowers, it was important to determine that nonborrowers were students who had financial need after subtracting their total grants and expected family contribution (EFC) from their total cost, but did not borrow. Therefore, this analysis was limited to students who were financial aid recipients and who had financial need after subtracting their total grants and EFC from their total costs. These students were identified first by eliminating students who were not financial aid recipients (TOTAID=0); second by eliminating students who had a need of less than $100 after subtracting their total grants and EFC from their total costs (RNEED6<100). Finally, borrowers were identified as students who borrowed at least $100 (TOTLOAN>=100). All other students in this subset were considered nonborrowers.

Education loans for 1989-90

Did not borrow	Financial aid recipients who had financial need after subtracting grants and EFC from costs, but did not borrow.
Borrowed	Financial aid recipients who had financial need after subtracting grants and EFC and who took out student loans.

Note that in the multivariate analysis need and income were controlled for, so all students were included according to whether or not they borrowed.

Grade Point Average and Persistence

Cumulative Grade Point Average (GPA)

The cumulative grade point average (GPA) was reported by the institution and converted to a 4.0 scale. If the cumulative GPA was not available, the most recent GPA was used instead.

Under 3.0	Student had lower than a B average.
3.0 to 3.49	Student had a B to B+ average.
3.5 or higher	Student had a B+ to A average.

Persistence (A combination of ATTEND and ATTNST3)

This variable represents the persistence or change in status from initial full-time enrollment (ATTEND=1) during one academic year (1989-90). These students were identified first by selecting only students who were full time in their first term of enrollment (ATTEND=1), and then looking at their persistence status (ATTNST3) at the end of the year. (See definition under "Attendance Status" in this appendix.)

Remain full time	Student maintained a full-time enrollment status for at least 9 months.
Drop to less than full time	Student initially enrolled as full time and subsequently dropped to less than full time.

Appendix B

Technical Notes and Methodology

The 1989–90 NPSAS Survey

The need for a nationally representative database on postsecondary student financial aid prompted the U.S. Department of Education to conduct the 1986–87 National Postsecondary Student Aid Study (NPSAS:87) and again in 1989–90 (NPSAS:90). The NPSAS sample was designed to include students enrolled in all types of postsecondary education. Thus, it included students enrolled in public institutions; private, not-for-profit institutions; and private, for-profit institutions. The sample included students at 4-year and 2-year institutions, as well as students enrolled in occupationally specific programs that lasted for less than 2 years.

The sample for the NPSAS:87 data collection consisted of students enrolled in the fall of 1986. The sample for the 1989–90 NPSAS (NPSAS:90), on the other hand, consisted of students enrolled in postsecondary education throughout the 1989–90 academic year, a more accurate representation of postsecondary students.

NPSAS:90 included a stratified sample of approximately 69,000 eligible students (about 47,000 of whom were undergraduates) from about 1,100 institutions. Students were included in the sample if they attended a NPSAS-eligible institution (see table B.1 for institution sampling frame); were enrolled between July 1, 1989 and June 30, 1990; and were enrolled in one or more courses or programs including courses for credit, a degree or formal award program of at least 3 months duration, or an occupationally or vocationally specific program of at least 3 months duration. Regardless of their postsecondary status, however, students who were also enrolled in high school were excluded.

For each of the students included in the NPSAS sample, there were up to three sources of data. First, institution registration and financial aid records were extracted. Second, a Computer Assisted Telephone Interview (CATI) designed for each student was conducted. Finally, a CATI designed for the parents or guardians of a subsample of students was conducted. Data from these three sources were synthesized into a single system with an overall response rate of about 89 percent. For example, the variable age was determined by first checking student responses. If a student did not provide this information, age was taken from the institutional record abstract.

For more information on the NPSAS survey, consult *Methodology Report for the 1990 National Postsecondary Student Aid Study* (Longitudinal Studies Branch, Postsecondary Education Statistics Division, Washington, D.C.: U.S. Department of Education, National Center for Education Statistics, NCES 92-080, June 1992).

Table B.1—Frame development: Number of institutions in the 1987–88 IPEDS-IC file and in the NPSAS:90 institutional frame

Educational Sector	Institutions in IPEDS-IC file	In NPSAS:90 institutional frame*
Total	12,243	12,868
Public, 4-year and above	638	633
Private, not-for-profit 4-year or above	1,944	1,983
Private, for-profit 4-year or above	120	125
Public, 2-year	1,257	1,333
Private, not-for-profit 2-year	845	894
Private, for-profit 2-year	850	891
Public, less-than-2-year	380	429
Private, not-for-profit less-than-2-year	515	543
Private, for-profit less-than-2-year	5,694	6,037

*Institutions that were not in the 1987–88 IPEDS-Institutional Characteristics (IC) file but were listed in the 1987 IPEDS-Fall Enrollment file or the 1987–88 Pell Grant institution file were added. Ineligible institutions such as central offices, nonexistent or closed buildings, and U.S. service academies were eliminated.

SOURCE: U.S. Department of Education, National Center for Education Statistics, *Methodology Report for the 1990 National Postsecondary Student Aid Study*, NCES 92-080, June 1992.

Accuracy of Estimates

The statistics in this report are estimates derived from a sample. Two broad categories of error occur in such estimates: sampling and nonsampling errors. Sampling errors happen because observations are made only on samples of students, not on entire populations. Nonsampling errors occur not only in sample surveys but also in complete censuses of entire populations.

Nonsampling errors can be attributed to a number of sources: inability to obtain complete information about all students in all institutions in the sample (some students or institutions refused to participate, or students participated but answered only certain items); ambiguous definitions; differences in interpreting questions; inability or unwillingness to give correct information; mistakes in recording or coding data; and other errors of collecting, processing, sampling, and estimating missing data.

Data Analysis System

Most of the estimates presented in this report were produced using the NCES Data Analysis System (DAS) for undergraduates. The DAS software makes it possible for users to specify and generate their own tables from the NPSAS data. With the DAS, users can recreate or expand upon the tables presented in this report. In addition to the table estimates, the DAS calculates proper standard errors and weighted sample sizes for these estimates.[17] For example, table B.2 presents the standard errors that correspond to table 2.1 in the text. If the number of valid cases is too small to produce an estimate, the DAS prints the message "low-N" instead of the estimate.

In addition to tables, the DAS will also produce a correlation matrix of selected variables to be used for linear regression models. Also output with the correlation matrix are the design effects (DEFT) for all the parameter estimates in the matrix. Since statistical procedures generally compute regression coefficients based on simple random sample assumptions, the standard errors must be adjusted with the design effects to take into account the NPSAS stratified sampling method. (See discussion under "Statistical Procedures" below for adjustment procedure.)

For more information about the 1990 PEDAR DAS, contact:

Arlie Gordon
NCES Longitudinal Studies Branch
555 New Jersey Avenue, NW
Washington DC, 20208-5652
(202) 219-1367

Internet address: AGORDON @ INET.ED.GOV

[17]The NPSAS sample is not a simple random sample, and therefore, simple random sample techniques for estimating sampling error cannot be applied to these data. The DAS takes into account the complexity of the sampling procedures and calculates standard errors appropriate for such samples. The method for computing sampling errors used by the DAS involves approximating the estimator by the linear terms of a Taylor series expansion. The procedure is typically referred to as the Taylor series method.

Table B.2—Standard errors for table 2.1: Percentage distribution of undergraduates' employment status while enrolled, by selected institutional and education program characteristics: 1989–90

	Not working while enrolled	Work 1–15 hours per week	Work 16–24 hours per week	Work 25–34 hours per week	Work 35 or more hours per week
Total	0.40	0.28	0.28	0.30	0.60
Attendance status: Persistence					
Part-time and/or part-year	0.49	0.27	0.30	0.38	0.69
Full-time, full-year	0.54	0.47	0.48	0.46	0.50
Control of institution					
Public	0.47	0.32	0.33	0.37	0.72
Private, not-for-profit	0.57	0.69	0.42	0.38	1.07
Private, for-profit	1.66	0.46	0.83	0.66	1.35
Level of institution					
Less-than-2-year	1.75	0.51	0.62	0.72	2.00
2- to 3-year	0.71	0.36	0.42	0.52	0.91
4-year nondoctoral	0.55	0.52	0.41	0.39	0.81
4-year doctoral	0.53	0.59	0.53	0.52	0.90
Type of institution					
Public					
Less-than-2-year	2.72	0.78	1.02	1.53	3.72
2- to 3-year	0.75	0.39	0.45	0.55	0.96
4-year nondoctoral	0.77	0.57	0.55	0.51	0.90
4-year doctoral	0.62	0.65	0.65	0.63	1.07
Private, not-for-profit					
Less-than-2-year	7.96	0.94	2.49	4.97	6.69
2- to 3-year	2.01	1.57	1.23	1.28	2.83
4-year nondoctoral	0.74	0.99	0.54	0.54	1.57
4-year doctoral	0.87	1.06	0.75	0.50	1.35
Private, for-profit					
Less-than-2-year	1.97	0.60	0.75	0.78	1.79
2-year or more	2.20	0.71	1.53	1.14	1.96
Undergraduate program					
Associate's degree	0.76	0.48	0.57	0.61	1.11
Bachelor's degree	0.43	0.46	0.38	0.36	0.60
Undergraduate certificate	1.12	0.51	0.63	0.70	1.46
Other undergraduate	1.11	0.53	0.57	0.71	1.35

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1989-90 National Postsecondary Student Aid Study (NPSAS:90), Data Analysis System.

Statistical Procedures

The descriptive comparisons were tested in this report using Student's *t* statistics. Comparisons based on the estimates of the proportions include the estimates of the probability of a Type I error, or significance level. The significance levels were determined by calculating the Student's t values for the differences between each pair of means or proportions and comparing these with published tables of significance levels for two-tailed hypothesis testing.

The 1989–90 NPSAS survey, while representative and statistically accurate, was not a simple random sample. Instead, the survey sample was selected using a more complex three-step procedure with stratified samples and differential probabilities of selection at each level. First, postsecondary institutions were selected within geographical strata. Once institutions were organized by zip code and state, they were further stratified by control (i.e., public; private, not-for-profit; or private, for-profit) and offering (less-than-2-year, 2- to 3-year, 4-year nondoctoral-granting, and 4-year doctoral-granting). Sampling rates for students enrolled at different institutions and levels (undergraduate or other) varied, resulting in better data for policy purposes, but at a cost to statistical efficiency.

Student's *t* values may be computed for comparisons using these tables' estimates with the following formula:

$$t = P_1 - P_2 \; / \; \sqrt{(se_1^2 + se_2^2)}$$

where P_1 and P_2 are the estimates to be compared and se_1 and se_2 are their corresponding standard errors. Note that this formula is valid only for independent estimates. When the estimates were not independent (for example, when comparing the percentages across a percent distribution—in this report, across a row in a table), a covariance term was added to the denominator of the *t*-test formula.

There are hazards in reporting statistical tests for each comparison. First, the test may make comparisons based on large *t* statistics appear to merit special attention. This can be misleading since the magnitude of the *t* statistic is related not only to the observed differences in means or percentages but also to the number of students in the specific categories used for comparison. Hence, a small difference compared across a large number of students would produce a large *t* statistic.

A second hazard in reporting statistical tests for each comparison is making multiple comparisons among categories of an independent variable. For example, when making paired comparisons among different levels of income, the probability of a Type I error for these comparisons taken as a group is larger than the probability for a single comparison. When more than one difference between groups of related characteristics or "families" are tested for statistical significance, one must apply a standard that assures a level of significance for all of those comparisons taken together.

Comparisons were made in this report only when $p \leq .05/k$ for a particular pairwise comparison, where that comparison was one of k tests within a family. This guarantees both that the individual comparison would have $p \leq .05$ and that when k comparisons were made within a family of possible tests, the significance level of the comparisons would sum to $p \leq .05$.[18]

For example, in a comparison of average hours worked per week while enrolled between males and females, only one comparison is possible (males v. females). In this family, $k = 1$, and the comparison can be evaluated with a Student's t test. When students are divided into five racial-ethnic groups and all possible comparisons are made, then $k = 10$ and the significance level of each test must be $p \leq .05/10$, or .005. The formula for calculating family size (k) is as follows: $k = j * (j - 1)/2$, where j is the number of categories for the variable being tested. In the case of race-ethnicity, there are five racial-ethnic groups (American Indian, Asian, black, Hispanic, and white), so $k = 5*(5-1)/2=10$.

Adjustments of means

Tabular results are limited by sample size when attempting to control for additional factors that may account for the variation observed between two variables. For example, in exploring the relationship between institution level (e.g., less-than-4-year and 4-year institutions) and how much students work, it might appear that students attending less-than-4-year institutions work more hours while enrolled than do students in 4-year institutions. However, one must take into account enrollment status (full-time/part-time), since students in less-than-4-year institutions are much more likely to attend on a part-time basis, and thus, have more time to work than do students in 4-year institutions. For those cases where the sample size becomes too small to support controlling for another level of variation, one must use other methods to take such variation into account.

In the multivariate analysis, we use regression coefficients to adjust the means (or proportions) to take into account variation due to other interrelated factors. The formula for calculating the adjusted mean for level (i) of category (j) is as follows:

$$M_{ij} = A + \sum_{ij}(P_{ij} * B_{ij}) - \sum_{j}(P_{ij} * B_{ij}) + B_{ij}$$

where:

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[18]The standard that $p \leq .05/k$ for each comparison is more stringent than the criterion that the significance level of the comparisons should sum to $p \leq .05$. For tables showing the t statistic required to ensure that $p \leq .05/k$ for a particular family size and degrees of freedom, see Olive Jean Dunn, "Multiple Comparisons Among Means," *Journal of the American Statistical Association* 56: 52-64.

M_{ij} is the adjusted mean for level (i) of category (j),
A is the intercept from the reduced regression model,
B_{ij} are the reduced regression model parameters, and
(B_{ij} * P_{ij}) are the products of regression parameters and the proportions of the weighted sample that are characterized by level (i) and category (j).

The regression coefficients used for this adjustment are estimated from a multivariate model where the dependent variable is the mean or proportion under study and the independent variables are selected from those that have been shown earlier in the report to be statistically interrelated.

The model uses binary (0,1) variables for each level of the categorical variables to include nonlinear effects. To avoid overidentification, redundant parameters are eliminated at one level within each variable (so that (i) has a single value for gender, (i) goes from 1 to 4 for the five racial-ethnic groups, etc.). Although the reference level is eliminated, its adjusted mean can still be computed by setting the value of B_{ij} to zero in the above equation.

It is relatively straightforward to produce a multivariate model using NPSAS:90 data, since one of the output options of the DAS is a correlation matrix, computed u. g pair-wise missing values.[19] This matrix can be used by most commercial regression packages to input the matrix and produce weighted least-square estimates of the parameters. That was the general approach used for this report, with two additional adjustments described below to reduce the effect of redundant parameters and to incorporate the design effect for statistical testing.

Since many of the independent variables are interrelated (as previously discussed in the report), the presence of some variables in the model is redundant. That is, the variance explained by them will have been accounted for by other variables in the model. Accordingly, redundant variables were removed from the model, resulting in a reduced regression model that was used to produce the parameter estimates shown in the above formula.

Most commercial regression packages compute parameter standard errors on the assumption of simple random sampling. For the NPSAS:90 data, this assumption is incorrect. A better approximation of their standard errors is to multiply each standard error by the DEFT of the dependent variable,[20] where DEFT is the ratio of the true standard error to the standard error computed under the assumption of simple random sampling. It is calculated by the DAS and is available with the correlation matrix.

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[19] Although the DAS simplifies the process of making regression models, it also limits the range of models. Analysts who wish to use different error assumptions than pair-wise or to estimate probit/logit models can apply for a restricted data license from NCES.

[20] The adjustment procedure and its limitations are described in the *Analysis of Complex Surveys*, eds. C.J. Skinner, D. Holt, and T.M.F. Smith (John Wiley & Sons, 1989).

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